A Cultural Ecological Approach for Meal Security
A Case Study of the Dynamics of the Food Habits in El Obeid, Sudan

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Abstract

Worldwide more food than ever is produced these days. It would be enough to feed everybody by far. However, only a limited group of the global population enjoys an adequate food supply. About 854 million people are undernourished worldwide. The global situation shows that hunger cannot be fought by just producing enough food. The socio-cultural complex of nutrition and food habits cannot be reduced to the production and marketing of crops. To fight the problem of lacking food security, ecological and socio-cultural conditions have to be taken into account.

This research focuses on the questions of 'what is food' and 'why is certain food eaten in a specific way' as prerequisites to understand the problem of malnutrition and food shortage as well as to fight food insecurity. Humans could eat anything that is digestible and not poisonous. However, they do not do so. Even though all human beings share the need to provide enough energy and nutrients for their metabolic functions, they do not think of the energy or nutrient content of food when they eat. Food is eaten according to certain social and cultural norms and meanings. Food usually is not consumed as grown or found in nature. Through technologies, skills, and knowledge the raw matter is transformed into a meal and eaten in a way according to given socio-cultural norms. People eat a culturally bound meal which satisfies not only their dietary needs but culinary desires. Food habits are a result of the interaction between different natural and cultural factors and the ability of the individual to interact with both these spheres.

Therefore, this research analyses the complexity of food habits, their dynamics, and how the food culture of a society interacts with the natural and socio-cultural environment. According to this, a cultural ecological concept of food culture - the cycle of meal - is introduced. It focuses on the interdependence and interactions of food habits within the natural and cultural environment. Moreover, the concept emphasises the importance of meal preparation as essential procedure of transforming natural raw matters into culturally bound products and as fundamental element to reach not only food but meal security.

This study bases on research conducted in the town El Obeid in Central Sudan, which is located in the remote and famine-prone environment of North Kordofan. The case study shows that food shortage can only be understood and fought if food culture is considered as a central element of meal security. Therefore, the research is based on the examination of food habits, their dynamics, and interactions within the socio-cultural context.

Schlagworte:

Sudan, Mahlzeitensicherung, Ernährungsgewohnheiten, Gender, Urbanisierung

Zusammenfassung

Die weltweite Nahrungsmittelproduktion ist so hoch wie nie zuvor. Dennoch kommt nur eine begrenzte Gruppe von Menschen in den Genuß eines ausreichenden Nahrungsangebots. Dagegen leiden weltweit zirka 854 Millionen Menschen an Mangelernährung. Das zeigt, daß Hunger nicht allein durch eine ausreichende Nahrungsmittelproduktion zu bekämpfen ist. Ernährung und Ernährungsverhalten kann nicht auf Produktion und Marktversorgung von Nahrung reduziert werden. Um das Problem von Nahrungsunsicherheit zu mindern, ist es ebenso notwendig, ökologische wie auch soziokulturelle Verhältnisse zu betrachten.

Diese Arbeit beschäftigt sich mit den Fragen ‚was ist Ernährung' und ‚wieso werden gewisse Nahrungsmittel auf bestimmte Weise gegessen'. Die Untersuchungen liefern Erkenntnisse, um die Ursachen von Nahrungsmittelknappheit und Mangelernährung besser zu verstehen und um Ansätze zu entwickeln, wie Nahrungsunsicherheit erfolgreich überwunden werden kann. Der Mensch könnte alle Produkte essen, die verdaulich und ungiftig sind. Dennoch tut er das nicht. Obwohl alle Menschen das gleiche Grundbedürfnis haben, genügend Energie und Nährstoffe zu sich zu nehmen, um ihre Stoffwechsel aufrecht zu erhalten, spielt die Aufnahme bei der Ernährung nur eine sekundäre Rolle. Nahrung wird vielmehr gemäß gegebenen sozialen und kulturellen Normen und Bedeutungen gegessen. Meist werden Nahrungsmittel nicht in dem Zustand genossen, wie sie die Natur hervorgebracht hat. Durch Technologien, Techniken und Wissen wird der Rohstoff in Anbindung an kulturelle Normen zu Speisen bereitet und auf die Art und Weise verzehrt, die der jeweiligen Kultur entspricht. Das Ernährungsverhalten ist somit an Kultur und Gesellschaft gebunden. Menschen befriedigen nicht nur ihre metabolischen Bedürfnisse, sondern vor allem kulturelles und soziales Verlangen. Die Ernährungsgewohnheiten sind das Ergebnis der Wechselwirkungen zwischen verschiedenen naturellen und kulturellen Faktoren und der Fähigkeit des Individuums in dieser Umgebung zu interagieren.

Daher untersucht diese Arbeit die Vielschichtigkeit von Ernährungsgewohnheiten, ihre Dynamik und beschreibt wie die Ernährungskultur einer Gesellschaft mit ihrer naturellen und soziokulturellen Umwelt interagiert. In diesem Zusammenhang wird das kulturökologische Konzept des Mahlzeitenkreises eingeführt, welches die Interdependenzen und Wechselwirkungen zwischen Ernährungsgewohnheiten und den naturellen und kulturellen Gegebenheiten in den Mittelpunkt der Betrachtung rückt. Ferner hebt es die Bedeutung der Nahrungszubereitung als entscheidender Prozeß bei der Umwandlung naturaler Rohstoffe in kulturelle Produkte und wesentliches Element zur Erreichung von Ernährungs- und vor allem Mahlzeitensicherung hervor.

Diese Arbeit basiert auf Untersuchungen, die in der zentralsudanesischen Stadt El Obeid durchgeführt wurden. El Obeid liegt in dem abgeschiedenen und häufig von Knappheit und Hunger betroffenen Umfeld von Nord Kordofan. Dieses Fallbeispiel zeigt, daß Nahrungsmittelknappheit nur verstanden und bekämpft werden können, wenn die Ernährungskultur als zentrales Element der Mahlzeitensicherung begriffen wird.

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Units of Measurement

Money

SD100 = SP1.000

SD100 = $US .45 or €0.35 (in January 2005)

Area

1 feddan: 1,038 acres, 4200 sq. m

1 acre: 0.963 feddan

1 mukhammas: 0.5 ha

Mass

1 sack of grain (1 shawal): 90 kg

1 sack of sugar: 50 kg

1 kora: nearly 1 kg of grain

1 mid: about 3 kg of millet

30 mid: about 1 sack of millet

1 ratul: 0.44 kg

List of Abbreviations

ABS	Agricultural Bank of Sudan
AD	Anno Domini
ADP	Adenosine diphosphate
AFDB	African Development Bank
ATP	Adenosine triphosphate
BC	Before Christ
CNS	Comprehensive National Strategy
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
GDP	Gross domestic product
GOS	Government of Sudan
HIPC	Heavily indebted poor country
ID/A	Iron deficiency and anaemia
IDD	Iodine deficiency disorder
IMF	International Monetary Fond
MDG	Millennium Development Goals
NCP	National Congress Party
NIF	National Islamic Front
SAP	Structural Adjustment Programme
SD	Sudanese Dinar
SP	Sudanese Pound
SPLM/A	Sudanese People's Liberation Movement/ Army
PEM	Protein-energy-malnutrition
UNDP	U.N. Development Programme
UNICEF	United Nations International Children's Emergency Fund
U.S.	United States of America
USDA	U.S. Department of Agriculture
VAD	Vitamin A deficiency
WFP	World Food Program of the United Nations
WFS	World Food Summit

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Introduction

a Hunger - A Local Challenge in Globalisation

Only a limited group of the global population enjoys an adequate food supply. Worldwide about 854 million people are undernourished. About 820 million of them live in countries with low income, 25 million in transition countries, and 9 million in industrialised countries (FAO 2006). Interestingly, worldwide more food than ever is produced these days. It would be enough to feed everybody by far. But hunger is no technical problem of agricultural or food production. It is much more a political, institutional, organisational, and socio-economic problem. It is a problem of access to and distribution of livelihood securing resources. And it is a problem of economic and political interest; a problem of profit and power – not only in the affected countries themselves but also in the surplus producing nations.

In 1996 government officials from more than 180 countries met for the World Food Summit (WFS) to find ways to fight hunger. Their eager but also illusory goal was to halve the number of undernourished people (based on numbers of 1990) to 412 million by 2015. Ten years later the above numbers show the sad reality that no progress has been made. Even though the United Nations and the Food and Agricultural Organization of the United Nations (FAO) try to brighten up this picture saying that at least the Millennium Development Goals (MDG) of halving the percentage of undernourished people by 2015 (from 20 to 10 per cent, in 2001-2003: 17 per cent) can be reached. This target is even further away from reality as they calculate on a high rate of population growth and a very small decrease in the number of undernourished people, being aware of a stagnating or in some years even rising numbers of hungry people. Looking at reality both plans – the WFS and the MDG – seem much more like an ease of conscience of the political elites. There is a wide gap between talks about what could be done and concrete actions targeted on present and specific problems. The political unwillingness to solve the problem of hunger becomes even clearer comparing the budgets to fight hunger and the ones to fight what they call ‘terrorism’ in modern days and the ones for military issues and to fight wars. There is no excuse for the continued occurrence of starvation and malnutrition in our present and future days. Therefore, each child, woman, or man who dies as a consequence of hunger and malnutrition can be seen as a murder committed by political and economic elites (cf. United Nations 2003: 21)

The discussion about food security by the leading international but also by many national institutions concentrates on the agricultural production of a few major staple foods and the main food commodities traded on official national and international markets. But no attention is paid to crops and commodities exchanged on the unofficial and non-monetary level. Moreover, live securing activities like the processing and preparation of foodstuff are totally ignored. Even if attention is paid to access to resources for different social groups, family structures are often disregarded. Hunger cannot be fought by only producing enough food. The socio-cultural complex of nutrition and food habits cannot be reduced on the production and

marketing of market crops. To fight the problem of food insecurity the contexts of ecological and socio-cultural conditions have to be taken into consideration.

The concept of food and nourishment is a complex system. All human beings share the need to secure an adequate diet which will provide them with energy and nutrients necessary for metabolic functions. Ingestion is a basic human need to stay alive. But when people eat they do not think of the energy or nutrient content of food. Food is much more than just nourishment and satisfaction of metabolic processes. For humans the definition of what they eat and its meaning within the socio-cultural context is of great importance. Humans could eat any matter that is digestible and not poisonous. But they do not do so. Certain products are selected according to given norms, rules, and values. Food is hardly eaten raw or in its natural state. Through technologies, skills, and knowledge the natural product is transformed into a culturally bound dish determined by socio-cultural norms. It is eaten according to a set of specific cultural traditions. The food patterns are a central element in every culture and are related to factors such as economy, political strategies, social organisation, ideology, age, class, gender, and family structure. This all has to be taken into account when discussing food security. Food security is more than food production, supply, and calorie intake. Food security is part of the complex matter of food culture and the analysis should include the production and supply of food, the transformation of matter and products into cultural goods, and the eating of meals with all its different kinds of natural and socio-cultural influences. Eating and with it meals are socio-cultural acts. Even though food production and marketing are essential parts of food security the final actions to secure the nutritional and culinary demands of the individual takes place within households and eating groups imbedded in their socio-cultural framework.

Too often it is forgotten that the securing of food also happens within the different spheres of the households – within the storage place, within the kitchen, and within the dining place. The skills, knowledge, and activities of mothers, wives, and daughters guarantee food security by transforming the food products into an eatable meal. Hence, to reduce hunger much more attention has to be paid to the activities and behaviour of household members concerning livelihood-securing activities.

Helping to reach food security and sovereignty requires the understanding of the food culture and lifestyle of the affected groups. To reduce malnutrition it is not enough to adjust the amount of food products or increase the average calorie intake. A satisfying food production or sufficient market supply does not feed the hungry if it does not reach their plates and stomachs. Grain does not fill a stomach as long as it is not prepared into a meal. In addition, a meal is not only containing additional ingredients, but also knowledge, skills, and labour. To fight hunger strategies and actions have to focus on the complexity of the food habits of those affected and have to fit into their socio-cultural system.

This study is about food and meal security in urban Sudan. It is going to demonstrate by the case of the town El Obeid that the problem of hunger has to be faced by examining the regional food culture. Sudan is one of the countries with a severe food gap. In many regions the rates of malnutrition are extremely high and there is no clear trend of an improving situation.

Several regions of the country have a long history of hunger. It was the famines of the mid 1980s and the early 1990s which drew special attention to food insecurity in Sudan. However, many studies have shown that they were no short-term phenomena but results of a long-term development. While the public and the media still connect Sudan with sudden hunger crises, chronic undersupply and malnutrition affecting many Sudanese cannot be denied and ignored. This situation developed not due to a lack of socio-cultural development or lacking abilities of those affected to avoid and fight shortage. For centuries the affected people have developed knowledge, skills, and strategies to buffer and fight shortage. Even though ecological factors have a high impact on the local food system the Sudanese food supply situation is highly influenced by economic and political mismanagement. Theoretically, in good seasons (under favourable climatic conditions) enough staples and additional products could be produced to feed everyone. Nonetheless, even then significant food gaps exist in many regions and households. A poor economic performance, an instable political system with inadequate policy-making, an instable and insufficient marketing system, lacking infrastructures, neglect of traditional agriculture, long-term environmental degradation, and decades of violent conflicts are just a few reasons for regional and intraregional food gaps. After the period of colonial oppression and exploitation, which already included suppressive politics and the separation of the southern parts, the country has never developed a stable, sustainable, and peaceful political system. The period since independence has been characterised by decades of civil war, several coup d'états, every time calling out a new revolution and changing ideologies, and growing Islamisation. This has made the development of a stable and sustainable socio-economic system impossible and has destroyed essential socio-cultural structures and the livelihood of many citizens.

Sudan is a country with a wide range of climatic and cultural variations. It is hardly possible to speak of a general Sudanese culture, hence typical Sudanese food habits. The population consist of more than 500 different tribes, some with very different cultural and ethnical backgrounds, living in environments reaching from desert to tropical bush land and forest. A general average analysis of the whole of Sudan would be unrealistic and give a blurred picture. Ecological, economic, political, social, and ideological factors have different impacts on different regions or even different groups within a region. Moreover, decades of futile attempts to fight food shortage have shown that the problem cannot be solved on a macro-level, ignoring circumstances specific to locations within their socio-cultural contexts. Therefore, it is most important to focus on the situation and examine the perspective of those affected within their local natural as well as socio-cultural environment. Only an insight into the locality and not only into the overall average situation helps to identify constraints and problems of food insecurity and to develop targeted strategies for action. Even though hunger is a national and global problem, it has to be fought against locally.

b Objectives of the Study

Examining different impacts on and their interactive relationships with food habits this study aims to show the complexity of the problem of food culture, hence food security in Sudan. For a discussion of the problem of food security an understanding of the food culture is prerequisite. Food habits are a result of the interaction between different natural and cultural factors and the ability of the individual to interact with these both spheres. Food cultures of societies are not only the outcome of the utilisation of the natural environment and the reaction to metabolic processes but develop from interactions of different socio-cultural factors. Even if nourishment is a close connection between human and nature, cultural factors are of great importance for human food habits. To understand food patterns the influencing factors have to be seen as a whole complex set of influences and not as separate and isolated factors. As the food habits are part of culture and social reality the concept of food has to be regarded as dynamic, active, and interactive as it is embedded into the web of natural and socio-cultural relations and changes. These interactive influences are specific to each society and often vary even between different social groups.

Nourishment is a complex procedure itself. The issue of trying to improve the food situation in Sudan requires a complex analysis of the food patterns. Apart from considering the impact of various natural and socio-cultural aspects it has to be kept in mind that food security can only be reached when a meal is consumed. It is the prepared meal – the transformation of the raw into the cultural product – that feeds the people. Therefore, special attention has also to be paid to the process of preparing and consuming a meal. Apart from the importance of what people eat it is even more significant how and why they prepare and eat certain dishes a specific way. Each step from producing/ receiving a food product until eating a prepared and served meal embedded in the socio-cultural context is part of reaching not only food but meal security. Therefore, this study aims at demonstrate that the analysis of food security should not end with the examination of food production and supply but continue with the analysis of processing, preparing, serving, and consuming a dish respectively a meal which will be emphasised by the terminological change from ‘food security’ to ‘meal security’ (cf. Teherani-Krönner 1999: 206).

Examining meal security requires a local analysis considering the inner perspective of those affected. An overall analysis alone could not identify constraints and problems of the affected region and its individual inhabitants. Many studies and researches concerning food culture focus on publicly accessible levels of food habits and cuisines such as restaurants, media, or public food events or draw their conclusions from the analysis of agricultural production, markets, and average calorie intakes. However, hardly any research has been done on the level where food habits happen and eating as the last and decisive step of meal security takes place. This is mainly due to that fact that the procedure of preparing the meal often takes place in the invisible sphere of women (Teherani-Krönner 1999). Moreover, meals happen inside the households or inside eating groups and are very intimate procedures. The whole process is not only influenced by local nature and culture but also by individual perceptions,

preferences, and emotions. Only the inner perspective can identify the organisation within the household, the distribution of food, the division of labour, skills, knowledge, and feeling. Therefore, this study with the case of El Obeid, aims to demonstrate the significance of analysing and solving the problem of meal insecurity on a local level as well as the examination of different households will underline the importance of the inner perspective.

The case of the town El Obeid will also show that urbanisation respectively urban meal security is a pressing present-day problem. The Sudanese, like the worldwide population, are becoming increasingly urban. Even if hunger is often associated with rural poverty and neglect the high and rising numbers of city dwellers leads to new challenges for local, national, and international food systems. Apart from an increasing number of urban poor living under health- and life-threatening conditions the rising demand for urban products leads to challenges for food producing rural areas and for the national and regional food supply.

Foodways[1], as culture itself, are not a static fact. They are part of dynamic accommodative processes and have to be understood within a concept of change, exchange, and communication. Even if individual food habits are usually already determined during childhood, they are matter to change due to changing physical and socio-cultural environments. Occurring changes may lead to new opportunities or constraints for the individual, local, or even national food system influencing not only the meal security but also the lifestyle of the people. Especially in urban areas with a higher mobility changes may occur faster and more obvious.

According to the mentioned problems this study aims to analyse the matter of meal security in Sudanese towns at the case of El Obeid focusing on the following objectives:

Which natural and socio-cultural factors have a crucial impact on food habits and how do they interact with the food culture?

What is the present national food supply situation in Sudan and which factors have a significant influence?

What are the present food habits in El Obeid? Which factors have a significant impact, how do they interact with the food habits?

In which way does urbanisation lead to changes of the food culture? And how do urban food habits influence the society and culture as well as urban, rural, and national meal security?

What are the consequences, opportunities for, and perspectives of meal security?

This research by far will not be able to name and identify every influence, which is impossible due limited abilities of the researcher and the complex and dynamic character of food cultures. The study will follow a clearly structured and to certain factors restricted approach to stay practicable and to keep focus on the objectives. The separate reflection of the elements is just an analytical step. In the end the elements have to be seen as a whole and indivisible sys-

[1] The term *foodways* refers to the culinary practices respectively food habits of a society. It includes the procurement, processing, preparation, and consumption of food within the cultural context. Literally, it describes what and how people eat and why they eat the food in the given way.

tem. The researcher and reader is expected to see the problem of meal security as a complex matter with a variety of interactive, changing, and non-final influences within a dynamic natural and socio-cultural surrounding.

c Overview of the Study and Methodology

This study is structured into three main parts. The first part examines food culture and its interaction with the natural and socio-cultural environment. It aims to develop a new approach for the research on food habits. Chapter one and two introduce different human and cultural ecological approaches , which point out the interactions between and contexts of human being, society, and nature. The ideas of human and cultural ecology are reflected on the subject of food culture in chapter three. Building on these ideas and concepts and its reflection on the foodways a new theoretical concept for the research of food habits is developed in chapter four. The idea of the concept is to focus on the interacting natural and socio-cultural factors of foodways and to show that an examination of food culture is necessary to analyse and fight the problem of food shortage. It also outlines the different procedures of food habits from the production and procurement of food to the consumption of a prepared meal. Opposed to discussions about food security, which are mostly reduced to food production, marketing, and access to resources, the concept emphasises the importance of meal preparing and meal consuming procedures and underlines their relevance for meal security. As it is a fact that food security is only reached when the food is eaten the concept includes a terminological change from ‘food security’ to ‘meal security’.

Part two takes a closer look at the food culture and meal security of El Obeid, a town in Central Sudan. Chapter five to ten give a general overview over the food situation and habits in Sudan. Chapter five provides a country review as an introduction of the ecological, demographical, socio-economic, and political development and situation of Sudan while chapter six reflects on the historical development of the Sudanese food culture. Food shortage is still a present-day problem in Sudan. Therefore, chapter seven describes the present overall food supply situation in Sudan. As Sudan is an agrarian country, this chapter focuses on the agricultural production and the influencing factors. Apart from ecological influences and agricultural production systems and its affects on the food supply the chapter pays special attention to the socio-economic and political framework. The analysis of the overall situation of the Sudanese food supply system does not imply that the matter of food habits and food security can be simplified and generalised. It is much more to demonstrate the importance and necessity of examining socio-cultural influences to receive an extensive, multi-angled picture which helps to identify the problems of food security and to develop efficient strategies to reduce malnutrition. Chapter eight deals with fermentation as an example for food processing methods. It explains the role of fermentation in the Sudanese food culture and its impact on meal security. Chapter nine introduces some staple foods and focuses on the dietary importance and cultural meaning of these kinds of food. As the products are not eaten raw examples of the preparation of the most common dishes are given. Chapter ten explains the main fea-

tures and characteristics of the gender cooperation concerning meal security identifying the roles, tasks, and responsibilities of the different household members.

In Chapter eleven and twelve the food habits of the town El Obeid are the centre of attention. Chapter eleven covers the objectives, methods, case studies, and chapter twelve the analysis of the empirical research. It examines different cases within the given settings and concentrates on the procedures from food supply and procurement to the consumption of a meal within an eating group. The individual and group behaviour, actions, perceptions, and preferences become the focus of attention. The different cases also demonstrate the importance of meal preparation and meal consumption for the concept of food security.

Chapter thirteen contains the present eating habits in El Obeid from the cultural ecological perspective. This chapter not only analyses the findings of the cases but also reflects them on the problems of urban food habits. It also includes an analysis of the dynamics of the food culture in connection with socio-cultural change and its consequences for a sufficient diet and meal security. As bread plays an important role in the changing food habits one section deals with the consumption of bread and its symbolic meaning for modernity, urbanity, flexibility, and freedom as well as for a certain political and economic strategy. An urban research field was selected specifically to raise awareness for urban meal security as a pressing present-day problem. Therefore, the perspectives, trends, and constraints of urban meal security are considered as well

Part three consists of the résumé of the research. Chapter fourteen aims to connect the theoretical approach with the empirical findings. The reflection of the findings on the concept of the cycle of meal emphasises the fact that the problem of meal insecurity and malnutrition cannot be solved by ignoring the food habits. Food culture and eating patterns of people are a complex procedure including different processes within a complex natural and socio-cultural framework, which has to be considered when trying to improve the dietary situation of people.

This analysis is based on the extended study of appropriate secondary literature, internet research, and empirical data collection in Sudan. The considerations of the human and cultural ecological approaches of the interactions between the human being, nature, and culture as well as the discussion of food culture and food habits form the basis for the development of the theoretical as well as methodological concept. Even though most of the background information about Sudan originates from literature and online resources the core analysis of this research bases on the empirical data collection, which was carried out in El Obeid. The primary research consists of six different case studies of urban households and describes the daily activities, behaviour, attitudes, and perceptions of the family members concerning their food habits. The data was collected by participant observation in the households, semi-structured interviews, and talks with different household members but also with interviews of experts from non-governmental and governmental institutions as well as through market observation.

Part I: Theoretical Concept

The Cycle of Meal - A Cultural Ecological Approach

1 Human Ecology

1.1 Principles of Human Ecology

Human ecology is the science of the coherence and interactions between society, human being, and environment. It focuses on a holistic reflection of ecological, social, cultural, economic, and political aspects (Glaeser 2003).

Human ecology was established in the early twentieth century as a field of research of sociology. Robert Ezra Park, professor of sociology at the University of Chicago was its founder. The research of Park was on the urban development process. The centre of attention was the urban way of living as relationships of neighbourhoods, forms of interaction and communication, competition, and social strata (Haberl 2003, Teherani-Krönner 1992a, 1992b).

Although human ecology was established as a part of sociology and distinguishes from the ideas of bio-physical ecology it shows analogies to it. Based on the theories of Haeckel[2], human ecology used the idea of relations of organisms and environment for its research of the social environment of human societies. Park refers to similarities of urban development and the understanding of the environment of flora and fauna. The parallel concerns especially the theory of succession and climax[3]. Moreover, research methods are suggested which differentiate between the research of the interactions of organisms and the analysis of the relationship with the environment (Teherani-Krönner 1992a, 1992b).

The paradigm of human ecology focuses on the analysis of the environment – no matter if biological or cultural. The environment is a changeable condition which can cause the adaptation of organisms, individuals, or human societies or rather can be changed through them.

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[2] Ernst Haeckel (1834-1919), German zoologist and nature philosopher, advocate of Darwin's 'Theory of Evolution' and founder of the ecology.

[3] Succession is the temporal sequence of plants or animal societies replacing each other at a location. It is an adjusted, systematic and predictable process. The composition of the species changes until a balance between the abiotic and biotic environment is developed. The pioneer stage (rapidly growing species with short life cycles; characterised by competition), is followed by an intermediate stage of high variety with more efficiently adapted species (phase of structure and consolidation). The theory of succession ends with the climax which is a steady state (most efficient and best adapted association) (Walletschek 1994). The concept of the climax has to be seen critically because a bio-physical system never develops into a static system. The 'balance of nature' rather is a continual process of change in which disturbances may disrupt a more general equilibrium. The succession is caused by the organisms themselves. The physical environment only gives the pattern and the pace of the changes (Teherani-Krönner 1992a, Walletschek 1994).

Nevertheless, human ecology dissociates from the biophysical ecology. Human ecology differs considerably from the bio-physical ecology by making a distinction between 'adaptation' and 'accommodation' (Teherani-Krönner 1992a: 77f.). 'Adaptation' - concerning biology - is a genetic process. In biological evolution it is supposed that all species are genetically related and that their development is divergent. Organisms adapt to their given environment by transmission that leads to selection (adaptation of plants and animal to their changing environment). Thus, biological evolution is a selective process in one direction (parents to children) which is directed by the bio-physical environment. This process is slow and irreversible. 'Accommodation', however, is the ability of human beings to interact with their natural and social environment based on their socio-cultural traditions. The ability is acquired by learning and passed on by traditions. Therefore, cultural evolution is genetically unrelated. Cultural evolution is a process of transmitting information into all directions. This is influenced by environmental, cultural, and social factors. The process of cultural evolution is fast and reversible (Fieldhouse 1996, Teherani-Krönner 1992a, Steward 1955).

In the process of 'adaptation' the individual is passive, as described in the theory of evolution. By contrast with 'accommodation' the individual and the group respectively takes over an active part in developing, creating, arranging, and changing the environment. Even if both developments – biological and cultural – lead to increasing complexity, the cultural development is an additive process while the biological is a substitutive process (Teherani-Krönner 1992a, Steward 1955).

As pointed out, the difference between 'adaptation' and 'accommodation', human ecology refers to the fact that human societies living in different places of the world in the same or similar natural environment differ from each other in their way of live. Human ecology emphasises that plants and animal societies mainly depend on the bio-physical environment whereas human societies in addition are arranged by cultural aspects (Teherani-Krönner 1992a).

This does not mean that human beings and human societies are detached and independent from their bio-physical environment, even if talking about two fundamental kinds of environment: the bio-physical and socio-cultural environment (Hawley 1998). The humankind and human society cannot be seen separately but as part of the bio-physical system which they largely experience through the mechanism of social organisation.

> "Ecology is the science of relationships between living organisms and their environment. Human ecology is about relationships between people and their environment. […] Although humans are part of the ecosystem, it is useful to think of human-environment interaction as interaction between the human social system and the rest of the ecosystem. The social system is everything about people, their population and the psychology and social organisation that shape their behaviour. The social system is a central concept in human ecology because human activities that impact on ecosystems are strongly influenced by the society in which people live." (Marten 2001: 3)

1.2 Conceptual Models of Human Ecology

The high complexity of the human-environment interactions makes it inappropriate to place human ecology into one specific science. It is not a special scientific field but encloses scientific interests in many different disciplines. It covers a multitude of research fields. Thus, human ecology is characterised by the 'concept of interdisciplinarity' (cf. Bruckmeier 2003: 70) since there is no common concept, epistemology, or research methodology. Human ecology has to be seen as an integrated science with fragmented points of view.

> "Human ecology must involve cooperation of geography, sociology, demography, anthropology, social psychology, economics and many other natural sciences as well […]. The development of human communities and the interrelations of these communities with the totality of the environment is the concern of human ecology." (Thornthwaite 1940: 343-348)

In the next chapters, a few approaches[4] will be introduced, that show the range of dealing with the problems of human ecology concentrating on the human-environmental interactions.

1.2.1 Park's Human Ecological Pyramid

The basic principle of Park's concept of human ecology is the mutual connection between the two levels, which describe the human society: the biotic substructure and the cultural superstructure.

According to Park, the human society differs from plant and animal societies since cultural elements such as communication and consensus reduce biological and economic competition (Serbser 2003a, b). Park's explanation is the relation between biological competition and social control of individual interests and social rules. Thus, human ecology examines how biotic balance and social equilibrium are reached, maintained, or disturbed.

> "Human ecology is, fundamentally, an attempt to investigate the processes by which the biotic balance and the social equilibrium (1) are maintained once they are achieved and (2) the processes by which, when the biotic balance and the social equilibrium are disturbed, the transition is made from one relatively stable order to another." (Park 1936/1952: 158)

His model represented in a pyramid may be conceived as a hierarchy and describes the interactions between nature and culture.

The pyramid of human ecology (Figure 1) is set up into four orders. The base is the ecological order - as element of nature – followed by the economic order, the political order, and on top the moral order - as element of culture (cf. Teherani-Krönner 1992a: 131 ff.). The four orders are not isolated from each other. They are in permanent interaction.

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[4] The selected approaches are not all so called 'human ecological models'. Some use the term of social ecology but they all have the same guiding principle: the investigation of interactions between human beings/ societies and their environment. Therefore, the models are put under the roof of human ecology.

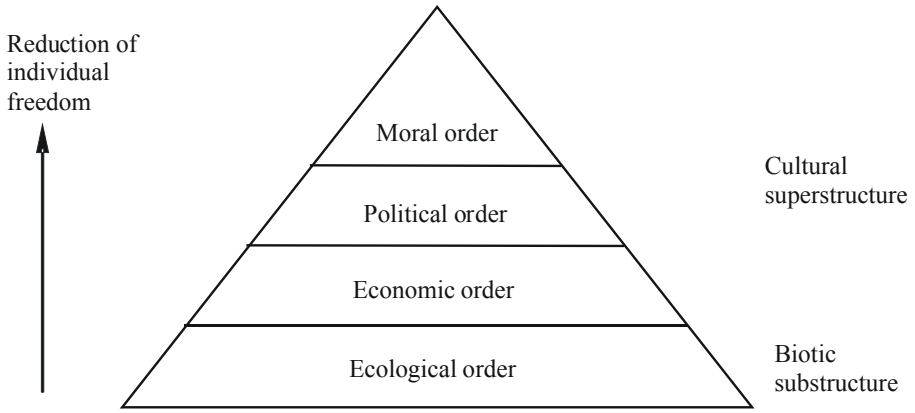

Figure 1: Park's Pyramid of Human Ecology (Teherani-Krönner 1992b: 27)

According to that, the human society is organised by two interactive structures: the symbiotic society (nature) and the cultural society (culture). Even if these two structures have different aspects, they still are in a mutual dependence of each other (cf. Park 1936/1952: 157).

The symbiotic society (ecological order) is characterised by unrestricted freedom of and competition between the individuals. The cultural society (economic, political, and moral order), building on the ecological order, is characterised by communication and consensus. Moving up, the individual freedom is more and more restricted. Park explains this by the presence of rules and laws established by society. These rules and laws limit competition and support co-operation[5] (Teherani-Krönner 1992a, 1992b).

The ecological base is required for the individual behaviour. Still, the behaviour is determined through economic, political, and normative aspects. The restrictions on individual behaviour are regulated by institutional structures with great importance for the development of social behaviour.

Apart from his pyramid describing the structure of the human society, Park defines four elements that construct the human society (cf. Teherani-Krönner 1992a: 134):

1. Population
2. Natural resources

} Nature

3. Artefacts (material culture)
4. Customs and believes (non-material culture)

} Culture

[5] The psychoanalysis makes a statement concerning the reduction of individual freedom through cultural development, too. For human cohabitation it is necessary that a majority develops which dominates the individual. The main step of this development is the replacement of the power of the individual by the power of the community. This only works under the condition that every member of the society reduces its possibilities of satisfaction. With the increasing cultural development, individual freedom is reduced. For the justice of every one living in the culture, no one can be exempted of the restriction. "Die individuelle Freiheit ist kein Kulturgut. Sie war am größten vor jeder Kultur." [Individual freedom is no cultural asset. It was the greatest before the existence of any culture.] (Freud 1930: 226).

This means, the population, the geographical position, the artefacts, and non-material culture determine the institutions of the human society. Still, nature is the base of the society. To deal with nature technological devices are invented. These technologies have an impact on population growth and density as well as on the natural environment of a certain location. Furthermore, technological devices influence the development of human society and its social institutions (Teherani-Krönner 1992a). Therefore, the culture of a human society can be seen as a symbiosis of the bio-physical environment (biotic substructure) and the material and immaterial culture (cultural superstructure) which is testified in the social institutions (cf. Teherani-Krönner 1992a: 91).

1.2.2 Duncan's Ecological Complex - POET

Duncan's model of human ecology – the ecological complex (Figure 2) – is made up of four concepts: population, organisation, environment, and technology – POET (Duncan 1959). This model gives the opportunity to formulate a hypothesis, which differentiates the elements and examines the interdependence between them (Friedrichs 2003).

As Park's human ecology concerns the biotic balance and the social equilibrium, Duncan focuses on social changes and cultural diversity. Duncan's human ecology tries to answer the questions:

> "How is human social life possible? What is the nature of the bond that holds men together? How does it come about that society of men differs from time to time and place to place – the problems of 'cultural diversity' and 'social change'." (Duncan 1959: 683)

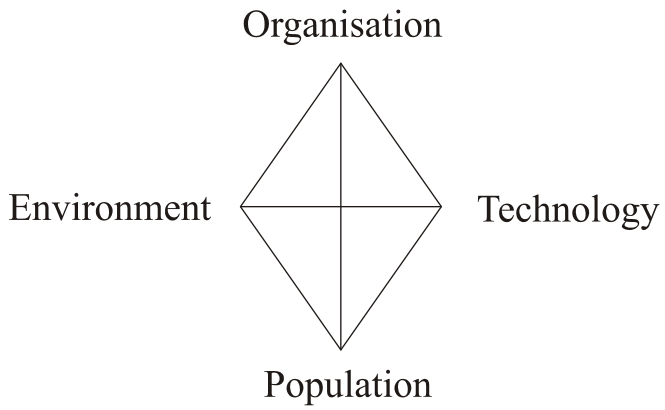

Figure 2: The Ecological Complex (Duncan 1959: 683)

Duncan's objective is to compare societies and its cultures. The assignment of the four elements to the categories nature and culture, as in Park, is not possible. Duncan's ecological complex breaks the hierarchy of Park's model open. He does not use the four analytic levels of the pyramid. Therefore, the ecological complex has no constitutive basis but focuses on the individual elements and the mutual relations. Duncan's four complexes can be seen as compounded elements of nature and culture. For example, the environment comprises natural resources (biophysical environment) and the environment is modified by man (human, social, or cultural environment). The fourth concept – organisation (in the sense of social organisation

and social structure) – can be understood like Park's levels of the cultural superstructure. Still, Duncan's approach is quite superficial and general and is missing a very important factor of human behaviour – the moral. Even if Duncan's element of 'organisation' contains elements of Park's 'moral order', he neglects aspects as ethics, traditions, and customs. However, aspects like competition from Park's 'ecological order' can be found.

> "Organisation represents an adaptation to the unavoidable circumstance that individuals are interdependent and that the collectivity of individuals must cope with concrete environmental conditions – including, perhaps, competition and resistance afforded by other collectivities – with whatever technological means may be at its disposal." (Duncan 1959: 683)

Furthermore, the four elements of Duncan's ecological complex are the result of the interaction between nature and culture. The focus of attention is on the interdependence of the four elements. If one of the elements changes, it will have an effect on the others[6].

1.2.3 Steiner's Triangle of Human Ecology

Steiner's concept of human ecology aims to develop a common model of human ecology[7]. He focuses on the individual, its behaviour and actions, and its part in the whole system of society and environment. He directly associates human ecology with cultural ecology as cultural ecology examines the manner of the relation between the human society and environment[8]. Hence, Steiner sees the concept of cultural ecology as fundamental for human ecology. 'The goal is to show, that the fundamental contribution to design a common human ecology is based on the idea of cultural ecology: what kinds of interaction exist between a society and its environment?'[9] (cf. Steiner 1992: 192)

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6 "An ecological account of social change is attempted by referring to such instigating factors as environmental changes…, changes in size and composition of population, introduction of new techniques, and shifts in the spatial disposition or organisation of competing populations. The interdependence of factors in the adaptation of a population implies that change in any of them will set up ramifying chances in the others." (Duncan 1959: 683)

7 To develop a human ecological theory Steiner (1992) suggests an interdisciplinary cooperation. Sociology and cultural anthropology examine the society, biology and geography examine the environment, psychology and physical anthropology examine the individual.

8 In Steiner's opinion traditional cultural ecology works on pre-industrial societies. In that case environment concerns only the natural environment. Therefore, Steiner postulates a common human ecology which broadens the concept of environment by the application of human influences and behaviour (Steiner 1992). "Die traditionelle Kulturökologie hat sich vornehmlich mit vorindustriellen Gesellschaften befaßt und meint deshalb mit ‚Umwelt' die natürliche Umwelt. […] In einer allgemeinen Humanökologie müßte ein um die menschlichen Einflüsse und Umgestaltungen erweiterter Umweltbegriff verwendet werden." [The traditional cultural ecology concentrated mainly on pre-industrial societies and therefore meant by ‚environment' the natural environment. […] An extended concept of environment has to be used in a general human ecology to include human influences and rearrangements.] (Steiner 1992: 192).

9 "Es ist Ziel […] zu zeigen, daß ihr grundlegender Beitrag für die Gestaltung einer allgemeinen Humanökologie in der kulturökologischen Fragestellung liegt: Welche Art von Beziehung besteht zwischen einer Gesellschaft und ihrer Umwelt?" [The aim is […] to show that fundamental contribution for the definition of a general human ecology bases in the cultural ecological idea: What kind of relationship exists between a society and its environment?] (Steiner 1992: 192).

Steiner's idea of a common human ecology bases on two components: a recursive system and an evolutionary perspective (Steiner 1992). Both are dependent on and can influence each other. The recursive system means the interactive and causal relation between the 'whole' and its 'parts'. The 'parts' concerning the 'whole' are constituent for it. The 'whole' concerning the 'parts' is regulative for them. Under the idea of an open future the evolutionary perspective shows the responsibility of human behaviour and how it changes the system. Looking back on the cultural evolution over centuries, conclusions about the form and changes of the relation between culture and environment can be made (Steiner 1992). The evolution (abiotic, biotic, and cultural) is a process which creates the enclosure of emergent recursive systems into existing recursive systems (cf. Steiner 1992: 206).

Considering human ecology, Steiner creates an interactive triangle of human ecology (Figure 3) with the levels of reality: individual – society - environment[10] ('**I**ndividuum – **G**esellschaft - **U**mwelt') (cf. Steiner 1992: 194).

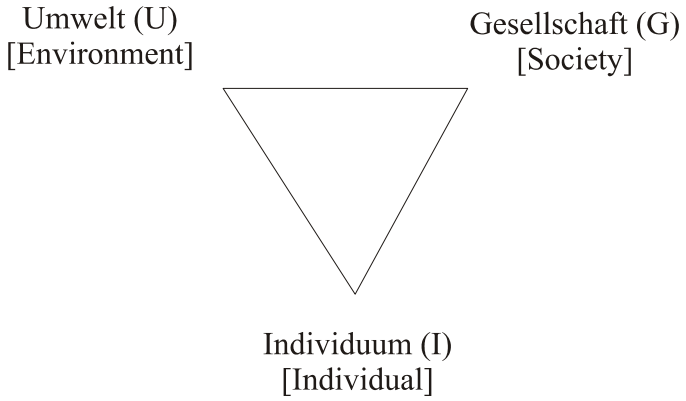

Figure 3: Triangle of Human Ecology (Steiner 1992: 194)

The individual (I) as biological being is connected to the biophysical environment (U) and part of the higher ecosystem. At the same time the individual is a socio-cultural being and part of the society (G). This shows the causal interaction of the individual with each system (I↤U and I↤G). As the connections I↤U and I↤G can be understood as causal relations, the direct connection between the environment and society (U↤G) cannot be seen as cause and effect. This connection is, in the culture ecological sense, a structural interaction between the environment and culture if the structures of both sides interconnect effectively. For a causal explanation of the influences on the environment by the society and reverse the individual is used as an intermediate (U⇆I⇆G). The behaviour of human beings has a direct or indirect

[10] The separate reflection of the three elements is just an analytical step. In the end the three elements have to be seen as a whole – an indivisible system of the individual, society and environment.

effect on the environment. Reverse, the environment affects the human beings physically or psychologically which has repercussions on the society (Steiner 1992)[11].

1.2.4 Fischer-Kowalski's Concept of Social Metabolism[12]

Fischer-Kowalski's model of colonisation is categorised in the research field of social ecology (cf. reference 4). It is a concept that describes the interactions between social and natural systems. The society as a so-called 'hybrid' (Fischer-Kowalski 2003) is found in the overlapping zone of natural and cultural effects. Fischer-Kowalski's aim is to develop a non-reductive macro-model of the society – environment - interactions (Fischer-Kowalski 2003). This Model is supposed to be epistemological consistent, to be interdisciplinary useful, and to give the possibility of intercultural and chronological comparison. The central concepts of the theory of the social-natural interactions are metabolism and colonisation (cf. Fischer-Kowalski 2003: 309).

Social metabolism bases on a society as open system, which takes in resources of the biosphere, transforms them, and gives them back to the biosphere. In case of a basic metabolism the society is dependent on natural processes. Their output somehow is reconverted into natural resources (that applies to societies of hunters and gatherers as well as agriculture). If the intake is too high, the reconversion is not fast enough and the subsistence is endangered. In case of an extended metabolism (in industrial societies), societies take in resources from outside the biosphere (e.g. fossil fuels) and release the waste into the biosphere. Under these conditions the society compensates the shortage of resources but creates a waste and pollution problem (Fischer-Kowalski 2003).

But the concept of social metabolism is not sufficient to describe the interactions between society and environment. For that, a second concept is necessary: the concept of colonisation of natural processes (Fischer-Kowalski 2003). Fischer-Kowalski (2003) describes colonisation as the intended influencing of natural processes by society for the satisfaction of social demands. The term colonisation is value-free but analytical. It describes the society in its well-aimed effort to change natural systems into colonised systems. That means certain parameters of the natural processes are changed for a certain output of the system. Through the process of colonisation, mental and symbolical elements of culture get connected to elements of the material world. From that, artefacts develop which are inherent elements of society.

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[11] This triangle of human ecology can be supplemented by Teherani-Krönner's (1992a) culture ecological model of interdependency with the three elements human being, nature, and society (cf. Teherani-Krönner 1992a: 140-141). This model focuses on social behaviour which connects the elements with each other. Technology is the connection line between the human being and its environment (Steiner's I↤U) (through work or instrumental action). Communication is (through language and communicative action) the connection line between the human being and society (Steiner's I↤G). The connection between the environment and society (Steiner's U↤G) is described as 'accommodation' (cf. Teherani-Krönner 1992a).

[12] This approach is the result of the research of the IFF Social Ecology, Vienna, whose director is Marina Fischer-Kowalski

The process of colonisation faces resistance which implies that colonised systems are much more fragile than natural systems. If there is no certain input to keep the hybrid and the colonised systems in their conditions, they will renaturise (Fischer-Kowalski 2003). To keep up the colonised elements of the natural system social organisation is necessary. Social structures, division of work, input of energy and matters, and especially human work has to focus on the preservation of the colonised system. That means that the society obtains certain output/ products from nature which it would not have had without colonisation. But at the same time society has to change and accommodate to its natural environment (Fischer-Kowalski 2003).

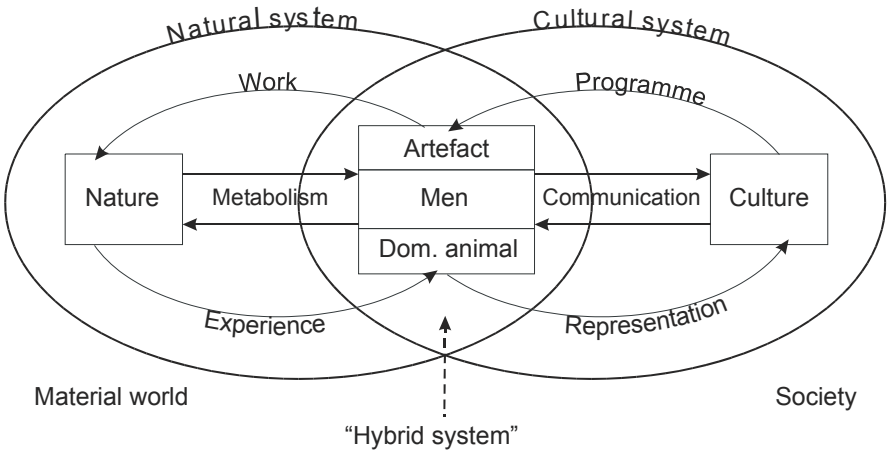

Figure 4: Mind-map of Social Ecology (cf. Fischer-Kowalski 2003: 315)

Figure 4 shows the interactions between society and environment. The cultural system bases on communication and is connected with the human population and other material elements of society. These are run by the cultural system through receiving their programme and representing their experiences within the cultural system. The human being is part of culture but at the same time an unrestricted part of nature as they depend on locality and time. It is impossible to say the human being is more cultural or natural. There are certain natural aspects that cannot be denied as human beings depend on them (gravitation, biological and chemical metabolisms). The natural system and its functions apply to the human being as to every other natural element (Fischer-Kowalski 2003). The causal interactions between society and natural system are inseparable. The human society, which cannot be reduced to the cultural system, is a hybrid between the natural, material, and cultural world (Weichhart 2003).

2 Cultural Ecology

2.1 Principles of Steward's Cultural Ecology

Cultural ecology was established by the anthropologist Julian H. Steward. It is characterised by the dissociation from human ecology. Steward criticises the human ecology for following the biological ecology. For him socio-cultural features are not genetically derived and cannot be considered like biological patterns.

> "Human beings do not react to the web of life solely through their genetically-derived organic equipment. Culture rather than genetic potential for adaptation, accommodation, and survival, explains the nature of human societies." (Steward 1955: 32)

In biology the laws of biological evolution apply independent of the bio-physical environment or species. However, it does not explain the different behaviour of different human societies and therefore it is not relevant to socio-cultural features. Even if Steward sees the human being as a part of nature and acknowledges a relationship between biological evolution and cultural evolution, he focuses on the analysis of socio-cultural processes. In Steward's opinion cultural evolution is dependent on the transmission of learnt behavioural patterns and knowledge which cannot be derived from a certain biological environment.

> "There is, of course, a relationship between biological and cultural evolution in that a minimal development of the Hominidae was a precondition of culture. But cultural evolution is an extension of biological evolution only in a chronological sense. […] In biological evolution it is assumed that all forms are genetically related and their development is essential divergent. […] In cultural evolution, on the other hand, it is assumed that cultural pattern in different parts of the world are genetically unrelated and yet pass through parallel sequences." (Steward 1955: 12)

Compared to human ecology this deduces general principles applicable to any cultural environment. Cultural ecology tries to describe the origin of cultural features which are typical for and differ in certain areas.

Moreover, cultural ecology is differentiated from anthropological approaches. On one hand Steward criticises environmental determinism (or cultural materialism) which sees natural conditions of the environment as main aspect of the development of society. On the other hand he criticises cultural relativism, since it describes cultural evolution and

> "[…] cultural differences are not attributable to environmental differences and most certainly not to organic or racial differences, they are merely said to represent divergences in cultural history, to reflect tendencies of societies to develop in unlike ways." (Steward 1955: 35)

The approach of cultural ecology is also characterised by the differentiation between biological (genetic) adaptation and the ability of human beings to interact with their natural and social environment based on their socio-cultural traditions – accommodation. Even if Steward calls it "cultural ecological adaptations" (Steward 1955: 34) it can be understood just as Park's 'accommodation'. For Steward cultural ecological adaptations "constitute creative processes" (Steward 1955: 34) which describe the interaction between nature and culture and can be seen as the origin of cultural evolution.

2.2 The Method of Cultural Ecology

As a methodological approach for the analysis of different cultures and societies and their interaction with the environment, Steward developed the concept of the 'cultural core' (Steward 1955: 37). All aspects of a culture are interconnected and dependent on each other; therefore, a holistic view is most important. The cultural core encloses social, political, and religious features, "which are closely related to subsistence activities and economic arrangements" (Steward 1955: 37). Still, there exist many other features which are connected to the core. Nevertheless, "cultural ecology pays primary attention to those features which empirical

analysis shows to be most closely involved in the utilisation of environment in culturally prescribed ways." (Steward 1955: 37)

The cultural core includes three fundamental procedures:

1. material culture
2. co-operation
3. immaterial culture

The first procedure (material culture) focuses on the productive technology and the relation of technology to the environment. To deal with its natural environment the human being uses technologies. The meaning of and dependence on the environment depends on the concrete cultural level of society. For example, a pre-agricultural society makes use of different technologies than an industrial society. The relevance of the environment depends on the particular society.

> "In primitive societies, subsistence devices are basic: weapons and instruments for hunting and fishing; containers for gathering and storing food; transportational devices used on land and water; sources of water and fuel; and, in some environments, means of counteracting excessive cold (clothing and housing) or heat. In more developed societies, agriculture and herding techniques and manufacturing of crucial implements must be considered. In an industrial world, capital and credit arrangements, trade systems and the like are crucial." (Steward 1955: 40)

Furthermore, cultural ecology is concerned with the fact, that different societies use the same technologies but use them differently and transmit different social arrangements in their own environment.

> "Other societies having about the same technological equipment may exhibit other social patterns because the environments differ to the extent that the cultural adaptations must be different." (Steward 1955: 38)

This leads to the second procedure. The co-operation and social organisation develop from the first procedure. Certain behaviour patterns and social organisation result from the utilisation of natural resources to secure subsistence. In other words, the second procedure describes the co-operation and social organisation concerning the production.

> "Some subsistence patterns impose very narrow limits on the general mode of life of the people, while others allow considerable latitude." (Steward 1955: 40)

Gatherers are more likely to live in competition, hunters and agrarians tend to organise a collective or work as individuals. For Steward, more complex and 'co-operative' subsistence activities do not depend on the cultural evolution, but on the natural environment.

> "Deer cannot be hunted advantageously by surrounds, whereas antelope and bison may best be hunted in this way […]. Dry farming may or may not be co-operative; and irrigation farming may run the gamut of enterprises of ever-increasing size based on collective construction of waterworks." (Steward 1955: 41)

The third procedure is the immaterial culture. The ideology and ethics of a society are part of the cultural core as they affect and are affected by the subsistence and production. Religion,

rituals, and the way of life influence the production and relation towards the nature as well as the social behaviour and organisation.

> "The third procedure is to ascertain the extent to which the behaviour patterns entailed in exploiting the environment affect other aspects of culture." (Steward 1955: 41)

Especially for the third procedure a holistic view is required as many cultural features like "demography, settlement pattern, kinship structures, land tenure, land use […]" (Steward 1955: 42) are seen separately but have to be understood interdependently.

For the concept of cultural ecology as in human ecology, it is important to understand the three procedures as interactive and interdependent elements. The concept of cultural core is not a constellation of isolated and unattached components. It describes the interaction of the latter between and to their biological and social environment. The interaction of the human being with its environment is determined by all different social factors. The use of technology is often influenced by cultural and social patterns and affects the natural environment as a complex system. This means that the employment of technologies is closely connected to the social context.

2.3 Teherani-Krönner's Cultural Ecological Model of Interdependency

Teherani-Krönner's (1989, 1992a) cultural ecological model of interdependency is an approach to examine the interdependency of the ecological and socio-cultural relationships within human societies based on its actions and behaviour. To understand the socio-cultural structure of human societies it is necessary to analyse the actions and behaviour of its members, which take places within the natural and social environment. The social behaviour develops from the confrontation of the human being with the nature and material world and the interactions between human beings through communication (Teherani-Krönner 1989: 199). The model follows the human ecological concept of Park and the cultural ecological approach of Steward. The basic elements are the human being, the human society, and the nature as well as the interaction of these elements through technology, communication, and accommodation. This model also includes the variables of Duncan's POET model as technology and communication are understood as the interacting connections between the human being and his natural as well as social environment. The model focuses on the interactions between the three elements nature, human being, and society and allows the analytical distinction and categorisation of the respective interactions (Teherani-Krönner 1992a: 141). Not through the three elements but through their interdependent relationship and interactive accommodation culture, social action and behaviour, and social transformation are made possible (Teherani-Krönner 1992a: 142). Therefore, the core of this concept is the behaviour and the actions of the human society. Apart from instrumental and communicative behaviour and actions, this approach also includes accommodative behaviour and actions. The model has to be seen as an open system which is constantly affected by new experiences and knowledge. Therefore, the interactions and prioritisation of the three elements cannot be defined (cf. Teherani-Krönner 1992a: 142).

To carry out empirical research Teherani-Krönner (1989, 1992a) develops three analytical levels: level of object, level of structure, and level of action and behaviour (cf. Teherani-Krönner 1989, 1992a). The analytical levels can examine the cultural ecological situation of the human society in a certain region, ecological potentials and limitations, socio-cultural structures, and potentials for changes. The three elements nature, human being, and society and its interactive connections - technology, communication, and accommodation – play a central role in this analysis. Even though the objective level (interactions human-nature/ material culture) and the structural level (inter-social relations/ social organisation) are analytical categories, the level of action and behaviour receives special attention as it describes the interactive connections between the elements human being, nature, and society. It is the way how the members of a society deal with each other, their problems, wishes, and needs of daily life. This includes interactions and behaviour but also refusal of interaction or behaviour, expressed and non-expressed facts, and verbal and non-verbal communication. Social behaviour and cultural change are influenced by the past, present, and future of the society. Therefore, the importance of cultural symbols, values, and norms and how a change or revaluation would affect the socio-cultural environment are of particular interest (cf. Teherani-Krönner 1989: 202, Teherani-Krönner 1992a: 145-146).

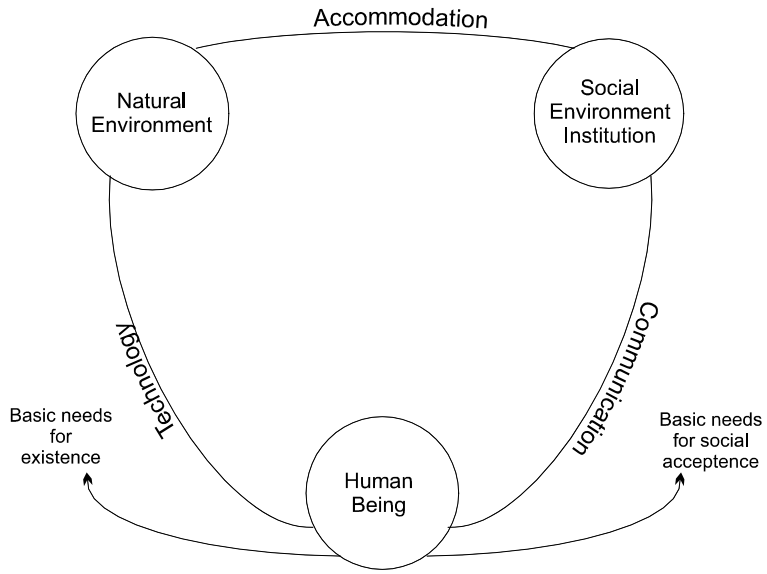

Figure 5: Cultural Ecological Model of Interdependency (cf. Teherani-Krönner 1992a: 142)

Due to the special attention to social actions and behaviour for analysing social relationships and interactions Teherani-Krönner distinguishes this level into three dimensions (cf. Teherani-Krönner 1992a: 146-161): instrumental, communicative, and accommodative actions and behaviour. Instrumental action and behaviour describe the relationship between the human being and the natural environment through technology. Certain daily life activities of human societies are determined by the natural environment. Through technologies people take advantage of natural resources or overcome struggles created by geographic and climatic challenges as the individuals aim to secure their subsistence. Even if technological development and knowl-

edge is an essential part in producing food or creating social structures this behaviour and action alone do not determine the social conditions. Communicative action and behaviour illustrate the relationships and interactions between human beings and social institutions by language and symbolic communication. The reason for communication is the basic need for social acceptance within the community. To make communication and cooperation possible the development of the same symbols, rules, and values within the society is necessary. The need to secure existence as well as social acceptance can be understood as the base for individual motivation in life which are determined and regulated by technology, social cooperation, and organisation through socio-cultural interactions. The accommodative action and behaviour have to be understood as the arrangement between culture and nature, and the meaning and evaluation of the nature within the society through accommodation. While the instrumental and communicative action and behaviour mainly follows a rational purpose accommodative behaviour is the reciprocal exchange with the nature. Natural resources are not seen as constant and inexhaustible but the limitation of the nature and the regeneration of resources have to be taken into account. Natural and social resources are not only considered as potential but also as an endangered good which has to be dealt with carefully and responsibly. Hence, accommodative behaviour includes elements of the instrumental and communicative behaviour. It even goes further as the consciousness of the results of the instrumental behaviour are part of the cultural relationship between nature and human society. None of these three behavioural dimensions (as well as the elements of the society) can be seen isolated. The interactions between technology, communication, and accommodation form the balance between nature and culture and are essential for the development or destruction of the natural and social environment (Teherani-Krönner 1992a).

3 Diets and Foodways from a Cultural Ecological Perspective

3.1 The Reflection of Human and Cultural Ecology on Food Culture

All introduced approaches emphasise the importance of the consideration and connection of both natural and cultural aspects although they have different ways of facing the problem of research. Even if the approaches do not focus exclusively on the food culture of human societies they are closely connected to it. Food is a central element of every culture. Food patterns become a means to an end as they describe the relationship between the humans, their nature, and their socio-cultural environment. The foodways of every culture construct and reflect socio-cultural characteristics and interactions of the society, its members, and nature and therefore can be understood as a mirror of socio-cultural structures.

Park's human ecological pyramid and the four elements that construct human society discuss the changeable state and possible interactions of the natural and cultural environment. He describes the culture of a human society as a symbiosis of the bio-physical environment and the material and immaterial culture. As the foodways are a central element of all cultures, the very clear structure of Park's approach can easily be reflected on the food culture and its interactions with the natural and cultural elements. Following Park's idea, nature is the fundamental element for the food culture as it determines food supply and production. The human

being uses natural food resources through certain technologies to produce and process food and transfers natural resources into cultural goods. The interactive orders of the cultural superstructure (economy, politics, moral) shape the food habits (production, processing, consumption) by influencing the cultural behaviour.

Duncan's concept of POET centres on social and cultural changes and the interdependence of his four conceptual complexes that are compounded elements of nature as well as culture. His approach indicates the interactive processes of the society within its environment. This interdependence also reflects the dynamics of food cultures. Changes within the ecological complex affect the food habits as well as changing food habits influence the other elements of the system. As Duncan's POET complex aims to generate the 'level of living' (cf. Duncan 1959: 707) of a society, food habits have to be included as one point of interest. Still, his approach is quite superficial and general and is missing a very important factor of human behaviour – symbolism, which is an essential influence concerning the food culture.

Steiner moves away from focusing on the system of elements towards the interactions within the system as a whole. He underlines the causal interactions within and interdependence of the system by setting the behaving individual as medium between as well as part of society and nature. Fischer-Kowalski's model of social metabolism and colonisation focuses on social processes and their effects on the natural environment and the consequences for society and its behaviour. The human society is the connecting link ('hybrid') between the natural and the cultural system. The open and non-reductive character of the model gives a clear insight in the social-environmental-interactions. Reflecting Fischer-Kowalski's and Steiner's models on food culture, they emphasise the importance of understanding food habits within an interactive concept of change, exchange, and communication. The human diet is imbedded in the dynamics of the natural and the socio-cultural system and as part of a holistic system no event is uncoupled from the rest of the system.

Steward's concept of the 'cultural core' focuses on the interactions and interdependence of natural and cultural aspects. The interaction of the human society with its environment is determined by all different social factors. Material culture, co-operation, and immaterial culture are closely connected by the interactions/ behaviour of the individual as members of the society. Thus, the cultural core encloses social, political, and religious factors that are related to subsistence activities and economic arrangements. This makes it impossible to create a universally applicable theory as the prioritisation of the procedures is open to the empirical findings for each society. That also applies for the research on food cultures of societies. Examining the food culture, it has to be taken into account that no natural and socio-cultural element is isolated from the others. The development and changes of food cultures are based on the natural and social environment and the ability of the individual to interact with the system.

The centre of attention of Teherani-Krönner's model is the socio-cultural behaviour as it forms the socio-cultural structures and the relationships between human being, society, and nature. In the interactive system nature and society are constantly affected through instrumental, communicative, and accommodative behaviour whereas new experiences and knowledge lead to development and changes. Teherani-Krönner underlines that every kind of behaviour

and action affects the whole system. Especially the dimension of accommodative behaviour describes the reciprocal exchange between society and nature. The socio-cultural meaning of nature and the dealing with and behaviour towards nature has to be understood in a cultural context. This also applies to the food culture of a society. The food habits cannot only be seen as the rational aim to secure the livelihood of the society members. Food patterns are characterised by socio-cultural dimensions of the society embedded in a complex socio-cultural system. They are a result[13] of the interactions between the individual, society, and nature.

3.2 The Meaning of Food

Food is a central element of every culture. As the human being has to consume food everyday to survive, food habits like almost no other mean describe and mirror interactions between the human being, nature, and culture. The food culture of a society can give detailed information about social structures. The foodways formulate the relationship of humans to nature and describe them and their social environment. Through their food patterns they convey their relationship to fellows and kin as well as to supernatural beings. Foodways structure the world and society and express thoughts, meanings, and emotions. Therefore, studying food patterns is a path to understanding culture, history, and social interactions as well as the relationship of human beings with nature.

Nourishment always has had a crucial impact on the development of societies and cultures. Observations from food processing have been the basis of knowledge in chemistry. The water wheel, originally used for the grinding of cereals was an important tool of the industrial revolution. Until the 18th century medicine was based on dietary knowledge. Religions are characterised by nourishment rules and taboos. Wars were won by the better-fed armies. And for many centuries the status of a person has been judged by the food presented to guests (Tannahill 1988).

But what is food? All human beings share the need to secure an adequate diet, which will provide them with energy and nutrients essential for metabolic functions. Ingestion is the basic human need to stay alive. However, eating just for the sake of maintaining metabolic functions, one could just eat a certain amount of any digestible, non-toxic plant, animal, or artificial product which covers the demand for energy and nutrients. But people do not do so. The range of nutritional requirements is quite small, but the ways of meeting these requirements are enormously diverse (Fieldhouse 1996). When people eat they do not think of the energy or nutrient content of the food. Food is much more than just nourishment and supply for metabolic processes. When people are asked ‘what is eaten’ they will not answer ‘carbohydrates, protein, fat, or vitamins’. They will name a food product or even a dish. It is not so much the physiological aspects which govern the nourishment of people but socio-cultural aspects and the consequences for the social environment (Barlösius 1999, Beardsworth and Keil 1997, Counihan 1999, den Hartog and van Staveren 1995, Fieldhouse 1996).

[13] The result has not to be understood as a final status. It much more is the sum of various natural and socio-cultural factors which are flexible and matter to change all the time.

Ingestion is the closest connection between human beings and nature. Human diets are determined by what people can get from nature. However, the amounts, kind, processing, and way of food human beings eat is not just influenced by biological factors but are a result of cultural, social, symbolic, and psychological experiences, knowledge, and norms (Barlösius 1999, Beardsworth and Keil 1997, Counihan 1999, den Hartog and van Staveren 1995, Mennell et al. 1992). Even if human beings depend on naturally supplied food like animals do, the way of consumption is very different. Compared to animals human beings are not naturally bound and biological determined to a specific environment. They have to find their way of eating themselves. Through self-determination they have to and are able to decide how to make use of the manifold opportunities supplied by nature (Barlösius 1999). Moreover, humans are able to develop technologies to be relatively independent from nature. Humans could extend their diets by a huge number of plants and animal but culture limits the selection of what is defined and accepted as food (Barlösius 1999). In contrast to animals human beings think about and prepare their food (Wirz 1993). The ability of producing and procuring food, the art of food preparation, and the way of consuming the meal requires culture. The meal in its entirety (from the raw product up to the consumption) is a cultural production which cannot be described by natural categories only. It is not only important what is eaten but how the meal looks like, and how it is prepared and consumed (Barlösius et al. 1997, Barlösius 1999, Beardsworth and Keil 1997, Tannahill 1988, Wirz 1997).

> „Eating and drinking are not just of physiological importance. Eating and drinking are social behaviour. It does not just contribute to nutrition and [...] to keep body and soul healthy. Eating and drinking create identity. Eating and drinking are our closets bonds to nature but both are always indivisibly related to our culture. For the creation of a meal we are guided by our knowledge and desires, from palate and eye, from emotions and sense always mediated by the values of our culture." (cf. Wirz 1997: 440)[14]

Food patterns are a central element in every culture and related to factors such as economies, political strategies, social organisations, and ideology (Barlösius et al. 1997, Barlösius 1999, Beardsworth and Keil 1997, Counihan and van Esterik 1997a, den Hartog and van Staveren 1995, Fieldhouse 1996, Fitchen 1988, Kittler and Sucher 2004, Meigs 1988, Mennell 1985, Tanner 2002). Even if the natural environment of different cultures might be the same their food cultures will differ significantly from each other. Food patterns are part and reflection of socio-cultural characteristics and social behaviour. Eating is connected to an enormous number of values and norms and full of symbolic meanings. Looking at the food habits of people (what, where, how, with whom they eat and what they say about it) can discover the eaters' social and cultural background, their social behaviour and organisation, and what they think about culture and nature (Barlösius et al. 1997, Barlösius 1999, den Hartog and van Staveren

[14] "Essen und Trinken haben nicht nur physiologische Bedeutung. Essen und Trinken sind soziale Handlungen. Sie dienen nicht bloß der Ernährung und dazu [...] Körper und Geist gesund zu erhalten. Essen und Trinken stiften auch Identität. Essen und Trinken sind unsere engste Verbindung zur Natur, beide jedoch sind unauflöslich verbunden mit unserer Kultur. Bei der Zusammenstellung der Mahlzeiten lassen wir uns vom Wissen und von Wünschen leiten, vom Gaumen und vom Auge, von Gefühl und Verstand, immer vermittelt durch die Werte unserer Kultur." (Wirz 1997: 440)

1995, Fieldhouse 1996, Kittler and Sucher 2004, Meigs 1988). Eating not just reflects our self-portrait but also our relationship to the outside world (cf. Wirz 1993: 20).

> "Food is a product and mirror of the organization of society on both the broadest and most intimate levels. It is connected to many kinds of behaviour and is endlessly meaningful." (Counihan 1999: 6)

Food habits as part of the culture are learned experiences (Axelson 1986, Beardsworth and Keil 1997, Fieldhouse 1996). They are not biologically determined but transmitted from one generation to the next. They are historically derived and confirmed in early social learning. It is not necessarily a conscious process as we usually are unconscious of our culture. Our behaviour is routinised and we are often unaware of things we do or why we behave that way (Axelson 1986, Fieldhouse 1996, Mintz 1994). To understand the food patterns of people it is not enough to find out what is or is not eaten, but why it is or it is not eaten because the cultural life has a major impact on the eating behaviour. Even if the immediate consequence of food intake is biological, it is connected to a wide range of geographical, economic, political, social, religious, normative, and psychological factors (Counihan 1999, Meigs 1988). There is a wide range of potentially available food provided by nature for human consumption but every society just makes use of a limited selection according to their socio-cultural parameters (den Hartog and van Staveren 1995, Fieldhouse 1996, Mintz 1994). Food intake is not just a response to biological but much more cultural and psychological processes as eating meets not only biological but socio-cultural and emotional needs.

3.3 Natural Resources and Metabolic Needs

The natural environment is the fundament for the food supply available for the human diet. Climate (rainfall, temperature, climatic zone, sunshine duration) and geography (soil, relief) of a region determine what kind of plants and animals grow and how they grow in their habitat (den Hartog and van Staveren 1995, Fieldhouse 1996). Certain plants and animals are characteristic for a certain region. They adapt to their environment (resistance to cold, drought, heat, certain soil components, or preference of sun or shade) and form the basis for human nourishment. Depending on natural conditions and available resources people arrange their food production and food supply systems[15]. Furthermore, the way of processing and storing the available products is often determined by the natural conditions[16] (den Hartog and van Staveren 1995, Tannahill 1988). Conversely nourishment and food production can have serious impacts on the natural environment. The kind and intensity of agricultural production

[15] For example, pigs are not kept in Arab countries. According to Harris (1990) the taboo of pork is not only based on religious reasons but also a result of climatic conditions and production systems. The climatic conditions do not suit pigs. Pigs prefer shady conditions with good water supply. They could hardly survive in the hot dry climate of the desert and savannas. Ruminants are much more suitable for these conditions. Apart from their ability to adapt to the climate they show an optimum utilisation of the cellulose-rich pasture in semi-arid and arid region. Moreover livestock breeders in Arab regions originally were nomads. Pigs would be totally unsuitable for long travels in the hot, sunny, and dry environment (Harris 1990).

[16] Fresh milk products are mainly consumed in moderate or cooler climates. In hot climates milk is mainly consumed in sour or fermented form as these ways of processing (fermentation, pickling, drying) increase the shelf life of perishable products.

affects the nature. For example, extensive (monoculture) production systems, deforestation, clearing of land, drainage of wetlands, or using genetically manipulated plants can cause destruction of vulnerable biotopes, natural structures, and equilibrium (erosion, desertification, over-fertilisation, pollution of surface and ground water, lowering of the water table). This again can have serious effects for agricultural outputs and health of human beings.

Because of seasonal variations of the weather in most regions of the world fresh food is not available during the whole year. Natural fluctuations and shortfalls in food supply can also occur unexpectedly because of natural hazards (drought, floods, other unfavourable weather conditions, pests, epidemics). During periods of no vegetation and yield people have to find alternatives to secure their food supply.

The influence of the natural environment on the nourishment of a society never occurs on its own. Depending on the way of life and kind of production system the impact of nature on the food supply can vary strongly. The integration of society into nature and the integration of nature into the way of life are decisive for the impact. For example, agrarian societies much more depend directly on natural factors than urban people do. Especially self-sufficiency production systems strongly depend on natural resources and seasonal variations. Urban people on the other side depend on income and market supply. Even though urban markets can be influenced by seasonal and regional supply, it might not be significant as the supply is often supra-regional without seasonal fluctuations (den Hartog and van Staveren 1995). Moreover, the economic development can determine the influence of natural factor on the nourishment. In industrial nations the food supply is quite stable and fairly independent from natural influences because of different technological, economic, and political factors. Crops and livestock can be grown under optimised conditions without being subject to natural influences (greenhouses, air-conditioned sheds, special breeds and cultivations, artificial fertiliser, pesticides, irrigation). Many food products and ingredients are artificial and standardised products or food is imported from various regions from all over the world.

An adequate diet is needed to provide the human organism with energy and nutrients necessary for metabolic functions which are pure natural processes. To maintain essential body functions (basic nutritional requirement) and to carry out physical activities the human body needs a certain amount of energy. These nutritional requirements depend on age, sex, and activity with individual variations. The main nutrients are carbohydrates, fat, protein, and water. Carbohydrates in form of starch and sugars make up the main energy source. Fats, apart from providing energy (storage fat), take over important metabolic rolls as they provide essential fatty acids and are a component of the cell membrane and solvent for fat-soluble vitamins (structural fats). Protein provides nitrogen and essential amino acids which take part in the synthesis of tissue. Protein as part of enzymes is essential for many chemical reactions (metabolic and digestive) and as component of hormones they regulate and control important metabolic processes. Moreover, they participate in the transportation of important substances (e.g. oxygen, iron), are essential for the muscle contraction, and provide energy.

About 60 per cent (infants up to 70 per cent) of the human body is made up of water. It is nutrient, solvent, mean of transport, and regulates the body temperature. Through metabolic

actions the body looses water permanently hence an adequate daily water consumption is essential. In moderate climates with medium physical activities an adult has to consume a minimum of 1.5 litre water a day (child 850ml). Depending on the physical activities, the climate and temperature the demand changes respectively (Latham 1997).

Other important nutrients are minerals and vitamins. Mineral nutrients are essential inorganic substances, which have to be supplied through the diet. They can either be bulk minerals or trace minerals. Their functions are to provide stroma and supporting tissue, to regulate the osmotic pressure, and to take part in many other metabolic processes (neurological, enzymatic, hormonal, transport processes). Vitamins are organic compounds essential for the body. They have catalytic or regulating functions concerning other nutrients, are involved in synthetic processes (blood, cells, bones), act as coenzymes for various proteins, or are active as hormones (Latham 1997).

An inadequate supply of macro- and micronutrients can lead to serious deficiency symptoms and distract the metabolic system as well as the physical and mental development. Especially children are very sensible to wrong nourishment as most of their bodily functions are in development progresses. The most common malnutrition-related diseases are iron deficiency and anaemia (ID/A), iodine deficiency disorder (IDD), protein-energy malnutrition (PEM), and vitamin A deficiency (VAD). Another serious malnutrition-related[17] disease is obesity due to an over-consumption of energy-rich food (WHO 2006).

3.4 Technology

To deal with the natural environment human beings use technology. Especially for nutrition and securing the livelihood, technologies are essential. Just living on raw products found in nature could not guarantee a sufficient diet. Even pre-agricultural societies made use of different technologies when hunting, gathering, and processing food (Steward 1955). The use of productive technology and the relation of technology to the environment stand in close connection with the social organisation and the cultural development of the society. The supply of basic food through domestication and breeding of plants and animals and certain agricultural production methods have increased the living standards of human societies tremendously. European agriculture and therefore the food supply made significant progress in the late Middle Ages through the invention of agricultural tools like the plough and the introduction of agricultural methods like three-field crop rotation[18]. This led to improving soil fertility and higher yields (Tannahill 1988). In modern ages up-to-date, the yields are increased by the use of tools, fertilisers, pesticides, special breeds, and special cultivation methods. Modern large-scale agriculture uses very complex and high technologies and can be characterised by monoculture production with a separation of crops from livestock. While traditional and subsistence

[17] Malnutrition not only means undernutrition or the insufficient intake of nutrients. Malnutrition also has to be understood as wrong or bad nutrition.

[18] The field is divided into three parts: on one part wheat or rye is grown, on one legumes, barley, or oats, and one part is left to fallow.

farming usually focuses on methods like multi-cropping with a diverse agricultural system and the integration of crops and livestock.

However, technologies are not just important for agricultural production but also for storage, processing, and preparation of food. For storage of food, conservation is one of the most important technologies. Through conservation (e.g. drying, salting, pickling, fermenting) food can be stored over a certain period and is available even during the off-season. Processing and preparation methods are necessary to make most livestock and crop products edible and digestible. Often food can only be made edible by changing the physical and chemical characteristics of the ingredients through certain preparation technologies (e.g. soaking, fermenting, boiling, frying, or roasting) (Mennell et al. 1992, Wirz 1993).

People adjust their technologies according to their natural environment (resources, availability) and cultural development (norms, rules, desires). Through the use and development of certain technologies consumption patterns and even culture can change tremendously as the case of the industrial revolution demonstrates. Modern machines, chemical inputs, irrigation systems, production methods, and new breeds have made agricultural production more efficient and larger fields can be cultivated with higher and stable yields. Apart from improving agricultural production through new machines and tools the major impacts of the industrial revolution for the nourishment were innovations in the area of preservation, processing, mechanisation, and transport (Goody 1997, Kleinspehn 1987).

With the industrial revolution canning and freezing were introduced. Canned products could be stored for several years and freezing made it possible to store fresh products (unprocessed meat, vegetables, fruits) r many months[19]. Originally, preserved food products were produced to supply armies and fleets. With the improvement and mechanisation of the preservation and canning processes canned food got more important for the nourishment of the growing labour force in the industrial sector (Hanson 2002, König 2002, Mennell 1985, Wilk 2002). The conservation of meat and vegetables had a significant impact on the consumption patterns of the people. Meat – now slaughtered in slaughterhouses in large amounts - did not have to be eaten immediately after slaughtering and due to the lower production costs even low-income households could afford to eat meat (Barlösius et al. 1997, Kleinspehn 1987, Mennell et al. 1992, Tannahill 1988). Meat became a reasonable, easily available, daily product which not only reduced class differences but also the distinctions between every-day food and special occasions[20]. The preservation of fruits and vegetables had been a known traditional method which was practiced on household level. But the mechanised conservation of vegetables and fruits not only improved the quality of the product, but also reduced the price through increasing automation of the process. Canned vegetables became reasonably priced which enlarged the

[19] The conservation processes were based on the research of Nicolas Appert (1749-1841) and Louis Pasteur (1822-1895).

[20] In lower strata meat consumption was very rare und even in better-off rural households meat was mainly consumed on special occasions. In urban areas the meat consumption had mainly been restricted to the upper class as fresh meat was very expensive.

food supply, especially of income-weak households, significantly, and overcame seasonal variations in the diet (Kleinspehn 1987, König 2002, Tannahill 1988).

Apart from the availability of processed food, which changed the preparation and cooking activities of the households, the invention of fuel, industrial gas, and electricity changed the cooking process tremendously. Since the late 19th century open fireplaces and ovens have been replaced by gas and electric stoves. The new stoves were not only easier to control and reduced the cooking time, but also banished the effort of getting wood and cleaning the stove from ash (Kleinspehn 1987, Mennell 1985, Tannahill 1988).

The industrial development was also accompanied by a changing lifestyle of the population. With the industrial growth the labour force in the new factories and urban population rose rapidly. The working class households had to buy their food and as the women also worked in factories their household activities, including meal preparation, had to be reorganised. The new industrial food therefore fitted perfectly into the new lifestyle especially of the working class. Industrial food reduced the price and the preparation time of food (Barlösius et al. 1997, Goody 1997, Kleinspehn 1987, Mennell 1985). The process of industrialisation can also be seen as the rationalisation of the household sphere. Especially the mechanisation of the kitchen and the cooking process helped to accelerate industrialisation and the transition into a consumer society.

Even industrial innovations, which were not directly connected to food production, had an impact on the nourishment of the people. New machines, new methods of metal processing, and the generation of electricity affected the agricultural production and the processing of food. Moreover, the invention of the railway and steam engine and the establishment of new infrastructure allowed faster transportation of larger quantities of goods and food products within countries, between continents, and across the oceans. Products from all over the world could be transported easily, quickly, and quite cheap. A region did not depend on local products and seasonable distinctions any longer. Furthermore, the improved infrastructure reduced differences in food supply between different regions and rural and urban areas (Barlösius et al. 1997, Goody 1997, Kleinspehn 1987, Mennell 1985, Mennell et al. 1992, Montanari 1994, Rebora 2001).

Today, more than ever, people use technology to grow, produce, and distribute food. Apart from a tight, worldwide trade and transportation network, the main food production uses modern high technologies (e.g. machines, chemistry, genetic manipulation). Most food products in retail are pre-processed and processed products, or are made according to (international) standards of a certain shape, size, and composition. While the nourishment of agricultural societies and their use of technologies stand in a very close relationship to nature, the urbanised and mechanised world lives on industrial food which has got hardly anything in common with the original natural product. As almost every modern household is rationalised and owns a refrigerator, the shelf life of food is not essential anymore. Appearance, taste, added (e.g. vitamins, microorganisms) or reduced (fat, sugar) ingredients, preparation convenience, or even the wrapping (e.g. event packages), which are made possible by modern food engineering, are much more important (Buckland 1994, Jönsson 2002). On one side the tight

network of globalisation and industrial processes leads to specialisation, diversity, and exchange. Nevertheless, on the other side it also leads to monotony and suppression of local cultures and differences as the food market is controlled by a relatively small number of companies, which produce, process, and market the bulk of food. It also supports worldwide standardisation of the food culture (Harriss-White 1994, Mennell 1985, Montanari 1994). More than ever most people of the world depend on the food produced, processed, and distributed with highest technologies.

3.5 Economic Function of Food

The economy, on micro and macro level, has a decisive impact on the diet. The economic situation of a household depends on its income, assets, properties, and access to resources. To some extent these factors determine what kind of commodities (including food) and services are available and affordable for the household. Moreover, the household's diet is influenced by the way of life and the economic activities. For example, a rural household with self-sufficiency depends on its own food production and the diet is according to the production patterns. In case of an additional income (e.g. cash crops, surplus production, paid labour, handicraft sales) the diet can be affected by food exchange, extra food purchase, or investment in the own food production (Kuhnlein and Receveur 1996, Tannahill 1988). By contrast, a household without any food production, which generates an income (e.g. urban household, farm worker, cash crop producers), has to provide food through its monetary assets and relies on the market supply (Goodman and Redclift 1991, Tannahill 1988). The income determines what kind, how much, and where food can be bought. With an increasing income the food patterns usually change. This can be described as "nutrition transition" (Nestle 2003: 16). The consumption of traditional plant-based and fibre-rich food is reduced and more meat, fat, sugar, and processed food are eaten (Barlösius 1999, den Hartog and van Staveren 1995, Nestle 2003). According to Engel's Law[21] the relative expenditure for food decreases with an increasing income. A low-income household spends about 70 per cent of its income on food, whereas a high-income household spends only about 30 per cent of its income (cf. den Hartog and van Staveren 1995: 30). Nevertheless, the absolute expenditure of the high-income household is higher as more expensive food is preferred (Barlösius 1999, den Hartog and van Staveren 1995, Nestle 2003, Warde 1997).

The diet is not only determined by the income and possessions of the household but also by market prices, market supply and mechanisms, infrastructure, and changes in the local and global food production (Kuhnlein and Receveur 1996). The price of food products has a strong impact on the access to food. A household can only afford the products it is able to pay for. Hence, the income in relation to the price determines the food supply of a household (Kleinspehn 1987, Mennell et al. 1992, Sen 1981). For example, in the Europe in the 19th century potatoes were the food of the low-income groups because they were very cheap. In contrast meat, wheat bread, or luxury food from overseas was reserved for the rich (Kleinspehn

[21] Ernst Engel (1821-1896)

1987, Tannahill 1988). However, with improving infrastructure and transportation facilities accompanied by an increasing world trade, prices for many food products (overseas products, but also staple food) had decreased. Prices not only fell and stabilised because of the increasing trade volume but also because of the expansion of the food supply (Barlösius et al. 1997, Kleinspehn 1987, Mennell et al. 1992, Teuteberg 1972a). This was made possible by the invention of industrial conservation and food processing methods, and the mechanisation of agriculture which produced food much more efficiently in huge quantities. This development has not only led to a suppression of self-sufficient production of food and dependence on industrial products, but also started the standardisation of products and the unification of taste (Kleinspehn 1987, König 2002).

Another economic factor that influences the diet is a change in the daily routine and in the family structure which also can be seen in the example of Europe in the 19th century when factory work was introduced and urbanisation increased. The daily routine of the working class was determined by the working rhythm of the factories and therefore influenced the meals and diet. At least one meal a day was not consumed at home with the family but during the breaks with colleagues (Barlösius et al. 1997, Barlösius 1999, Mennell et al. 1992). Since the women were also working in the factories, they had to reorganise the food preparation for the family. The time for cooking and money for food was limited, hence foodstuff was used which was cheap, quick, and easy to prepare (mainly industrial food)[22]. The possibility to pass on knowledge about food products and preparation was very limited, which led to a loss of regional diversity, experience, and knowledge (Goodman and Redclift 1991, Mennell et al. 1992, Tannahill 1988, Teuteberg 1972a). Up-to-date the social change is continuing with more and more women belonging to the labour force. This can easily explain the change in eating patterns and the increasing consumption of meals (which become snacks) outside the home.

Through globalisation trade networks, commodity streams, and market supply are more extended and intensified. In most regions of the world all kind of food from all different countries is available all over the year. Seasonal and regional differences are almost replaced through standardised products (Fieldhouse 1996, Voronina 2002). The trend moving from rural self-sufficiency to urban paid labour is undeniable. Another trend is the suppression of traditional self-sufficient production systems for the benefit of large-scale cash crop production. While the first focuses on the production of a food variety for home consumption, the latter concentrates on a few products, which can be produced more efficiently, and increase the profit (Haller 1993, Nestle 2003).

Most of today's supermarket food could be described as unnatural and artificial. The supply of all kinds of food products seems unlimited as new products are introduced all the time.

[22] The same phenomenon can be observed in many societies where the daily working load of women increases or their daily activities changes. In traditional systems women spend most time of the day on food producing/ preparing activities. If for any reason (e.g. changes in access to resources, change of the production system, entering the labour market) this equilibrium is disturbed it has a serious impact on the nutrition of the whole household.

However, it is not a variety of natural products but of industrial food mainly based on a few main crops. Most of the products are in a production stage that requires a minimum of preparation time and skills and reduces domestic labour – fitting for a 'modern' lifestyle (Warde 1997). The modern urban food culture also makes the shared meal into an old-fashioned procedure. The modern urbanite (many living in single or two-people households) does not waste time for a meal but prefers snacking. This leads to the situation were most people become detached from the food production and their traditional eating community and often do not have an emotional relationship to the food they eat.

> "In the 1980s the changes went even further. […] The onward march of the supermarkets was unstoppable. Imported foodstuffs tended to obscure any sense of season. Ready-made dishes were increasingly available; women no longer spent time in the kitchen and families no longer spent time together at table;[…]." (Robertson 2002: 202)

The emotional relationship to a food product is now generated much more through targeted marketing strategies (e.g. providing entertainment by fancy and highly symbolic packages or additional use) which tie the consumer to a specific food company (Jönsson 2002, Nestle 2003). This also includes the high dynamics of the food market. By selling already known products in a new design, with a new use, and satisfying artificial generated demands food companies overflow the market with literally the same products in new dresses to increase profit and market power.

> "The U.S. food industry is the remarkably successful result of the twentieth-century trends that led from small farms to giant corporations, from a society that cooked at home to one that buys nearly half its meals prepared and consumed elsewhere, and from a diet based on 'whole' foods grown locally to one based largely on foods that have been processed in some way and transported long distances. These changes created a farm system that is much less labour-intensive and far more efficient and specialized." (Nestle 2003: 11)

However, the economy is also influenced by the nourishment of the society. For example, an insufficient diet and malnutrition or overnourishment are often accompanied by illness and can have a significant negative effect on the economy. Malnourished/ overnourished people often suffer illness and physical weakness and cannot work as effective as healthy people can. As recent political campaigns show, malnutrition in both ways causes immense costs for governments and economy. Furthermore, malnutrition or overnourishment during early childhood can obstruct their physiological and mental development or even lead to irreparable physiological and mental disabilities or death (Latham 1997, Murray and Lopez 1996, Ruttan 1994).

3.6 Political and Power Function of Food

Governmental policies and decision making have a strong influence on the nourishment and food supply of societies. The control over the food supply of societies is a very important political instrument of manipulation. For time immemorial food supply and food shortage have been used as political weapons (Gabbert 2000, Kleinspehn 1987, Mennell et al. 1992, Paczensky and Dünnebier 1994, Tannahill 1988). For centuries, governments have released agricultural policies to regulate, protect, and control the supply and demand of food. Protectionism has already been know in the antiquity when authorities intervened in prices and market

mechanisms to ensure the food supply of the population, strengthen the agricultural production or underline social status and hierarchies (Barlösius 1999, Cathie 1982, Tannahill 1988, Teuteberg 1972a).

There exist several political instruments to satisfy or control different interest groups. For example, subsidies granted by the state to food producers enable them to sell these good at a low price, to compete with foreign traders, to avoid unemployment, or to guarantee a stable income. Subsidising consumption goods (e.g. staple food such as bread) can provide reasonably priced products and satisfy and ensure the basic food supply of the population. In each case subsidies motivate production or consumption but also mean high expenditures for the government. Subsidies are also often used to motivate the consumers to consume a certain product and to change preferences or consumption habits for the benefit of this product.

> "For example, during the 1328-30 famine, the commune of Florence undertook an expensive victualling policy, spending - according to the chronicler Giovanni Villani – 'more than 60,000 gold florins to support the people'; wheat and flour were sold at fixed prices in order to contain 'the anger of the people and the poor, and guarantee that everyone had at least enough to insure survival'." (Montanari 1994: 69-70)

By contrast, tariffs and quotas control, regulate, or reduce production, trade, and consumption. For example, protective duties on imports protect the domestic producer from foreign competition and guarantee the producers' income. Export tax, on the other hand, reduces export and keeps domestic prices low which protects the consumer. Nevertheless, governmental interventions in price and market mechanisms often impede the production, trade, or consumption of the concerned product with negative effects for the domestic economy.

Another important political instrument concerning nourishment and agricultural production are intervention purchases and sales. In seasons of high surplus production the government may buy the surplus and store it for seasons with low harvest. This stabilises the producers' income, the consumer price, and can guarantee a stable domestic food supply.

The nourishment of a society can also be influenced by governmental actions promoting certain products or dietary behaviour. It is very common that official institutions give dietary advice to promote a healthy nutrition of the people (e.g. consumption of vegetable, fruits, fibre, meat, dairy products). But food guidelines are often far from being objective or based on scientific knowledge.

> "[T]he USDA [U.S. Department of Agriculture] calculates numbers of servings by adding up individual components of mixed dishes and assigning them to the appropriate [Food Guide] Pyramid categories. This means that the flour in cookies is assigned to the grain category, the apples in pies to the fruit group, and the potatoes in chips to the vegetable group. This method may yield more precise information about nutrient intake, but it makes high-calorie, low-nutrient foods appear as better nutritional choices than they may be. The assignment of the tomatoes in ketchup to the vegetable group only reinforces the absurdity of the USDA's famous attempt during the Reagan administration to count ketchup as a vegetable in the federal school lunch program." (Nestle 2003: 9)

In many cases the dietary guidelines are shaped to satisfy economic and political interests of powerful lobbyists[23] (Fieldhouse 1996, Nestle 2003).

A very common political instrument to influence food patterns of societies is food aid. Even if most people link food aid with charity, it was originally introduced to create political and economic dependence and control. The original idea of food aid by the United States in 1954 ('Agricultural Trade Development Act', PL 480) resulted from the protectionist agricultural policies. It was meant to reduce expensive oversupply of the domestic agriculture and at the same time to create new international markets for U.S. products by changing the food habits of the recipient countries towards the new products and thereby establish a dependence on U.S. products. Usually recipients of food aid have to fulfil certain criterions. In case of bilateral food aid it is common that the supplier puts the receiver under political pressure to obtain a certain political and economic behaviour. Even in case of multilateral food aid the large suppliers have a high influence on the conditions and claims connected to food aid (Cathie 1982, Daldrup 1981, Friedmann 1994, Gabbert 2000, Goodman and Redclift 1991, Haller 1993, Ruttan 1993).

Other political factors having an impact on nourishment are violent conflict and wars. Besides life-threatening situations, armed conflicts lead to the destruction of the agricultural production systems and food trade. Moreover, the manipulation of the food supply is a very common weapon in conflicts. The destruction of the food supply of opponent forces or civilians can lead to capitulation. In addition, well-fed citizens and armies are very likely to support their authorities and win conflicts. Even if whole societies can be manipulated by those controlling food; food shortage for example (under peaceful or war situations) can also be a motivating factor for crime, rebellions, riots, or even civil war while satisfied inhabitants who have enough to eat tend to be peaceful and quiet (Barlösius 1999, den Hartog and van Staveren 1995, Haller 1993, Kleinspehn 1987, Mennell et al. 1992, Paczensky and Dünnebier 1994, Rebora 2001, Tannahill 1988).

The nourishment is also influenced by others than authorities. Control over food supply has been a key source and instrument of power throughout history. In the past the relationship and hierarchy of power and food was very obvious. The ones with control and possession of food, land, and water (e.g. landowners, farmers) had power over those depending on their resources (e.g. day labourer). Today these power structures are not that obvious. Nevertheless, the ones with high market power, food production, or access to and control of scarce resources have the power to influence, control, and manipulate food markets (den Hartog and van Staveren 1995, Harriss-White 1994, Kleinspehn 1987, Mennell et al. 1992, Tannahill 1988). Consumers are hardly aware of their dependence on the food production and industries. Food indus-

[23] In 1991 the USDA withdrew its Food Guide Pyramid in response to protests by the meat and dairy producers "because it was 'confusing to children'" (Nestle 2003: 51). "The USDA could not possibly have been acting in the interest of schoolchildren; that age group never had been designated audience for federal food guides. Instead, the USDA was responding to meat and dairy producers complaining that the placement of their food groups in the narrower, 'eat less' sectors of the Pyramid caused their products to be 'stigmatized'." (Nestle 2003: 52)

tries and producers are economic enterprises. They promote food products according to their interest in profit making. Food companies are no social or health institution and nutrition usually only becomes important if it helps to sell products[24]. Their marketing strategies strongly influence consumers' behaviours and therefore dietary patterns. Lobbying is a very common instrument of food producing companies (agricultural and industrial enterprises) to influence political decisions to assert their economic and political interests. The influence of powerful food companies or producer associations is often strong enough to influence official dietary advice in a way contrary to scientific knowledge (Fieldhouse 1996, Harriss-White 1994, Nestle 2003).

Food is a source of power also on community and household level. In many cultures the highest-ranking household member according to social hierarchies receives meals first, often containing the best parts of the food (den Hartog and van Staveren 1995, Kleinspehn 1987). Sometimes certain dishes are prepared that serve the preferences of the head of the household most. But those who control the available food and prepare it also hold power as they decide what and when is cooked and how the meal is prepared (Counihan and van Esterik 1997a).

3.7 Social Function of Food

That food and the act of eating are associated with innumerable cultural meanings is nowhere more obvious than in the daily incidents of social interactions. Food patterns reflect and describe social values and structure such as status, hierarchy, identity, friendship, communication, and traditions. Not only what is eaten but how and in the presence of whom the meals are consumed is an expression of very specific social characteristics.

Historically, food and meals have always been connected with social status and prestige of a household or social group. The kind of food and the way of consumption are determined by the living standard of the consumer (Barlösius 1999, den Hartog and van Staveren 1995, Drummer 1997, Fieldhouse 1996, Kleinspehn 1987, Mennell et al. 1992, Tannahill 1988, Teuteberg 1972a, 1998). Certain food, ways of preparation, serving, and eating are considered as clichés and distinguish between social classes and hierarchies (Beardsworth and Keil 1997). Some type of food confers high status onto the eater and others are associated with high status because of the group who usually eats them. During all eras and in all regions of the world status and food are closely connected. Generally, high status is connected to diets of variation containing energy- and protein-rich products as well as exotic food, complex dishes, or expensive ingredients. Low status is connected to monotonous diets containing fibre-rich and energy-poor products (Barlösius 1999, den Hartog and van Staveren 1995, Dirar 1993, Mennell et al. 1992, Paczensky and Dünnebier 1994). Meat for example, is an indicator of affluence. In many societies meat has been the food of the rich and powerful (Barlösius 1999,

[24] One example for the abuse of nutrition for product promotion and manipulation of the consumer is advertising of sweets as being healthy. Some food companies promote jelly bears as 'healthy' product as they do not contain fat. This aims to delude the consumer into thinking that he will not gain weight by eating the product, which is an effective message in times where obesity is a serious social health problem.

Fieldhouse 1996, Mennell 1985, Sandgruber 1997, Teuteberg 1972a, Wirz 1993). Only with the industrial revolution and the introduction of canned food, large-scale animal husbandry, and increasing trade and supply meat became more reasonable for the lower strata. Still, consumption of fresh meat on a regular basis was much longer found in the upper classes (den Hartog and van Staveren 1995, Fenton 1997, Mennell 1985, Mennell et al. 1992, Teuteberg 1972a). The rejection of prestigious food can be understood as social protest against the existing hierarchy. For example, vegetarianism is often a depreciation and contempt of the ruling class and criticism of existing social structures (cf. Barlösius 1999: 118-122).

Like meat wheat, especially in form of white bread, reflected high social status and was considered as a grain of prestige for hundreds of years. Since the antiquity, white bread (wheat) was food of the upper class whereas black bread (rye and barley) and porridge were food of peasants and servants[25] (Fenton 1997, Montanari 1994, Müller 2003, Paczensky and Dünnebier 1994). However, not only the colour was a matter of status. Bread was hardly available for the poor and 'dark' grains were much more suitable for the preparation of polentas, porridges, and meatless soups which dominated the rural diet until the early 20th century[26] (Barlösius 1999, Fenton 1997, Kleinspehn 1987, Mennell et al. 1992, Montanari 1994, Paczensky and Dünnebier 1994, Tannahill 1988, Teuteberg 1972a).

Social distinction was not only a matter of possession and access but also a political and even scientific issue. In Europe in the late medieval period and early modern ages, when resources of forest and pasture became scarce, hunting of venison was forbidden to all but the nobility (Fieldhouse 1996, Mennell 1985, Montanari 1994, Paczensky and Dünnebier 1994). In addition, the use of pasture was subject to political restrictions. Another significant political regulation was the introduction of 'sumptuary laws' which limited the quality and quantity of food

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[25] Rye was widely grown in the Mediterranean area and Europe because of its very high yields and adaptation to a wide range of climates and soils. In combination with other grains the risk of crop failure was minimised. Wheat was also grown but only in small amounts meant for the upper class. "The contrast between the two types of bread, which had definite social connotations, manifested itself chromatically as well: that made from wheat was white, from rye and other grains black. The former was prepared for the upper classes and was decidedly a luxury item. Black bread was for peasants and servants, whether made from rye, spelt or mixture." (Montanari 1994: 31)

Historically, white and refined food products are a symbol of status and affluence. With the improvement of the milling process flour became whiter and replaced dark coarse flour. White flour became a desirable product but was only available to the upper strata due to the price. This desire may be explained by the fact that the changing appearance of food involves complex and more modern technologies and therefore requires a higher degree of 'civilisation' which makes refined food into prestige products of high status. The taste, texture, and nutrients are not important in that case; the prestigious function of food is the driving force.

[26] The long absence of bread in rural households can also be explained by the existence of two manorial institutions; the mill and the oven. In many European regions tax had to be paid for both taking the grains to the mill and the dough to the oven. Therefore many of the rural population could not afford to make bread. Even when owning a fireplace their only possibility was to grind the grains in a mortar and cook a porridge or soup (Mennell 1985).

"Between the eleventh and thirteenth centuries, European agriculture witnessed considerable wheat expansion, as its cultivation gained ground from lesser grains. As a result, bread consumption - in particular, white bread consumption – increased. This development, however, benefited almost exclusively two select categories of consumers [...]: landowners, who collected rent from peasants in the form of wheat […], and city-dwellers, who, if not landowners themselves, could purchase wheat at the market." (Montanari 1994: 50)

which were allowed to be served for special occasion in non-noble households. These laws aimed to maintain the status structure of the society and avoid a rise in prestige of wealthy but common social groups[27] (Fieldhouse 1996, Mennell 1985, Montanari 1994, Paczensky and Dünnebier 1994). Even medical and scientific knowledge contributed to dietary differences of the strata. According to scientific knowledge only the poor were able to digest coarse and fibre-rich plant-based food, while the nobility could not have eaten that food because of their sensitive digestive system. Analogous the poor would not have been able to digest the food of the nobility[28] (Mennell 1985, Meyer-Renschhausen 2002, Montanari 1994).

Until the Renaissance the food differences of the strata was more a quantitative than a qualitative matter. However, with the introduction of sumptuary laws and especially new table manners and customs the social differentiation attained a new dimension. With the use of different cutlery and crockery for specific dishes, a set sequence of serving the meals, and strict rules of etiquette the upper class created not only a new food culture but also a very clear distinction from the common people (Barlösius 1999, Fieldhouse 1996, Meyer-Renschhausen 2002, Montanari 1994, Paczensky and Dünnebier 1994, Teuteberg 1972a, 1998). The status of someone was not judged by what he ate but by his good manners and behaviour at the table. While in the low strata food mainly had the function to feed people, for upper classes it was an important means of representation and an indicator of status. Only with industrialisation, improvement of the transportation, stabilisation of the food supply, and development of a strong urban middle class since the late 19th century, who accommodated the new rules of behaviour, social differences concerning food diminished and certain standards and manners applied to the whole 'civilised' society (Fieldhouse 1996, Kleinspehn 1987, Mennell 1985, Mennell et al. 1992, Montanari 1994, Paczensky and Dünnebier 1994, Tannahill 1988, Teuteberg 1972a, 1998).

Food also has a representational function. The way a host serves his guest represents his social status. At the same time the guest can judge by the served food how much respect the host shows for him. Serving guests with food or even carrying out feasts is a demonstration of status, rank, and power (Fenton 1997, Mennell 1985, Mennell et al. 1992). Moreover, shifting meals from home to public places reflects social status. Public meals for special occasions in form of banquets and for family feasts like weddings or baptisms have been known since the

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[27] "These were intended [sumptuary laws] to control 'private' behaviour and consumption - though the degree to which a banquet can be described as private is debatable - and so prevent waste and ostentation, excesses of the sort that occurred on the occasion of a wedding feast, in which the public image and personal power of a particular family or guild was in play. These laws found a basis not so much in moral considerations, but rather in problems of social and political control. They were intended to guarantee and maintain the institutional order and prevent the too rapid rise in prestige of certain social or professional groups which might otherwise threaten the existing equilibrium." (Montanari 1994: 82)

[28] "Giacomo Albini, physician to the princes of Savoy, predicted aches and illness for those who ate foods not appropriate to their social rank: the rich should not partake of heavy soups, like those made from legumes or entrails, which were not very nutritious and difficult to digest; the poor instead were to avoid excessively select or refined foods, which their coarse stomachs could not easily manage. […] Between 1542 and 1546, the physician Jacques Dubois […] published in Paris four booklets on the diet of the poor in which he was careful to suggest 'appropriate' foods and recipes: 'the poor have their own particular diet which is heavy and hard to digest, but perfectly suited to their constitutions'." (Montanari 1994:87-88)

antiquity. But since the late 19th century restaurants or eating-out facilities have become an everyday place of social differentiation in public (Drummer 1997, Meyer-Renschhausen 2002, Warde and Martens 2000). The kind of 'restaurant' (from a soup kitchen up to a luxury restaurant) represents the status and lifestyle of the consumer. Moreover, with the shift from private celebrations at home to public restaurants the host presents his monetary possibilities and gains prestige (Drummer 1997).

Within all levels of society the seating and serving arrangements of meals reflect social organisation. Whether within native societies, peasant or urban households, or courtly communities, the hierarchy within the eating community is reflected by the seating arrangement, the order of being served, and what kind of food is served to whom[29] (Beardsworth and Keil 1997, Paczensky and Dünnebier 1994, Teuteberg 1972a, 1998).

Moreover, food habits are an integral part of cultural behaviour and are closely identified with the social structures. The cuisine of each society or each group within the society contains cultural elements which are characteristic for the society or the group (e.g. age groups, professions, strata). Through the food habits a group can experience and represent its identity. Special food preparation, the consumption of specific dishes, or certain manners of serving and eating a meal have symbolic functions for the identity of the culture. They can only be recognised and understood by the ones who are familiar with them (Barlösius et al. 1997, Barlösius 1999, Bell and Valentine 1997, Fellmann 1997, Fieldhouse 1996, Haller 1993, Johnsson 1986, Sandgruber 1997, Wirz 1993). Generally, the cuisine of a group supports two processes: one is the creation of cultural identity; the other is the demarcation towards other cultures. The participation in a meal and particular preparation methods, dishes, and behaviour promote a sense of belonging and create a feeling of identity (Barlösius 1999, Bell and Valentine 1997, den Hartog and van Staveren 1995, Fellmann 1997, Fieldhouse 1996, Mennell et al. 1992, Menzel 2000, Neumann 1997). On the other hand demarcation of outsiders and exclusion from meals leads to an expulsion from society.

Certain dishes and kinds of food describe the affiliation to a specific culture, lifestyle, consciousness, or religion. Some food might be accepted by one culture but put under taboo by another. For example, the eating of raw meat and fish is linked with Inuit and Japanese, pasta is typical for Italians, fish and chips are common in Great Britain, goulash is connected to Hungarians, sauerkraut is typically German, corn is associated with Mexico, and burger and fast food are American food. The same principle applies to religion. The renunciation of pork is identified with Islam and Judaism, fish on Fridays is typical for Catholics, and the refusal to eat any meat characteristic is for Buddhism (Barlösius 1999, den Hartog and van Staveren 1995, Menzel 2000). Other food stands for certain emotions and lifestyles. For example, 'energy food' is associated with a sportive life and fitness, organic and health food is connected to environmental awareness and healthy lifestyle, functional food reflects a modern metro-

[29] It is very common that the heads of communities are seated at the front side of the table, where they are visible for everybody. In many hierarchical groups the heads also are served first with the best and biggest pieces of food (Teuteberg 1972a).

politan lifestyle, snacks and chocolate bars express youthfulness, while exquisite food stands for social advancement. The intimacy of food is stressed by the fact that sometimes a society or a certain group within society is named after the food which is characteristic for them in a derogatory or derisive way(Barlösius 1999, Fieldhouse 1996, Haller 1993): French are called 'Frogs', Germans are 'Krauts', Italians are 'Spaghetti eaters'.

The identity creating character of food is even intensified by the sharing of meals. The shared meal (in privacy and public) is one of the closest and most intimate bonds of social relationships. Sharing meals or drinks brings kindred spirits together and indicates acceptance, courtesy, esteem, affiliation, unity, solidarity, hospitality, confidence, and friendship (Barlösius 1999, Fieldhouse 1996, Müller 2003). Common eating and drinking is a symbol for and confirmation of social community and mutual responsibility and appreciation (Barlösius 1999). Hence, meal sharing is essential for creating and maintaining social relations (Bell and Valentine 1997, Counihan 1999, Fellmann 1997, Fieldhouse 1996, Haller 1993, Mennell et al. 1992, Müller 2003, Zingerle 1997). Nonetheless, the proper and just sharing of a meal does not mean equality of the participants. The distribution rules of a shared meal follow social structures and normative concepts of the eating unit. Hence, the participants receive what they are social and cultural entitled to (Barlösius 1999, Bell and Valentine 1997). Serving guests is another important cultural feature. It is a symbol of friendship and acceptance. Inviting a guest to join the family meal lets him enter a very intimate sphere which makes him a member of the community (Fieldhouse 1996, Haller 1993, Mennell et al. 1992, Teuteberg 1972a, 1998, Zingerle 1997). In all cultures social life is determined by occasions where food is shared. A special occasion without food is unthinkable and would be a bad reputation for the host. Specific occasions call for specific food and ways of serving (e.g. wedding and birthday cakes, Thanksgiving turkey, funeral meals, reception dinners, dinner parties). The food and drinks are often the highlight or central element of the event (Barlösius 1999, Fieldhouse 1996, Haller 1993, Mennell et al. 1992, Zingerle 1997). Probably the oldest ritual of food sharing is the sacrifice. The connecting element of a sacrifice is not only the religious act but the shared meal (Freud 1912-13, Zingerle 1997).

But food does not only create identity, it also is an important medium of structure and communication. Meal as a recurring event structures the day like hardly any other behaviour. In many eating groups (especially families) the communicative exchange during a meal is the only opportunity to discuss group problems, matters, and affairs (Barlösius 1999, Bell and Valentine 1997). Moreover, business dinners or official receptions are social institutions to discuss, maintain, and strengthen contracts and alliances. Other examples are 'coffee parties' which are essential for common information streams and exchanges (Bell and Valentine 1997, den Hartog and van Staveren 1995, Fieldhouse 1996, Mennell et al. 1992, Teuteberg 1972a).

Apart from sharing meals, food is commonly an accepted gift. Food gifts can express a diversity of emotions of the donor such as worry, sympathy, appreciation, or deep affection. Giving or exchanging food is highly valued in many cultures. It is a symbol of unity, peaceful coexistence, solidarity, and responsibility. Often it is a strong element of maintaining social networks and relationships within a community but sometimes it is also used to gain influence

and status within the group (Fieldhouse 1996, Haller 1993, Johnsson 1988, Meigs 1988, Paczensky and Dünnebier 1994).

3.8 Food and Its Function in Religion and Magic

The ideology of a society can be understood as the fundament for the behaviour of its members. Each society or group has its rules, norms, and laws which enforce and determine social behaviour and therefore guarantee the existence of the society (Barlösius 1999, Freud 1930). The sense and the purpose of the rules are unimportant. Only the observance of the rules ties the individual to the society (Freud 1930). Following specific social rules creates social identity and serves as non-verbal communication which is expressed by specific behaviour. Rules and norms give orientation and organisation which support the society member in its behaviour. Ignoring cultural norms can lead to disorientation, unsocial behaviour, loss of identity[30], or even to the destruction of social structures and the loss of moral standards (Freud 1930).

Following religious law has similar functions such as communicating with the supernatural force (God), demonstrating faith, enhancement of the feeling of identity and affiliation, rejecting worldliness, or expressing separateness (Barlösius 1999, Fieldhouse 1996, Paczensky and Dünnebier 1994). Food is an essential component of many religions and believes which involve it and its symbols in their rituals. For example, in Judaism and Christianity the transition of the human being from the unconscious to the conscious existence happens by breaking a divine law through an act of eating. After Adam eating the apple from the tree of knowledge the human was banned from paradise and became a conscious cultural being. The central ritual in Christianity is the Last Supper (Eucharist) of Jesus and his followers. With the ritualised sacrifice of bread and wine - flesh and blood[31] - the fall of Adam is going to be healed (Neumann 1997). This ritual underlines the central role of bread and wine not only in religion with the Communion - the ritual of eating God, but also its importance as the basic food of the Mediterranean world and later the Christianised northern and western societies. Bread is referred to as 'the staff of life'; it is not only a religious symbol but the symbol for food and life as such (Counihan 1999, Fieldhouse 1996, Montanari 1994, Neumann 1997, Paczensky and Dünnebier 1994, Walker Bynum 1985). As bread and wine in Christianity, dates are an essential symbol of Islam and are the food in many rituals.

One of the oldest pagan and religious rituals is the sacrifice of animals. Flesh and blood of the animal were enjoyed by the deity or supernatural force and his worshiper together. Sacrifices were public rituals of the whole religious community where every member received a part of

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[30] Nevertheless, even the breaking, rejecting, or ignoring of rules and norms is some form of communication and identity creation. The ones who rebel against existing rules form a new group following the 'rule' of opposing against the morals of others. Hence, even if non-compliance of norms, rules, and taboos has a negative effect on the society it still is a mean of communication and creates identity between the members of the opposing group.

[31] "14:22 …Jesus took bread, and blessed, and brake it, and gave to them, and said, Take, eat: this is my body. 23 And he took the cup, and when he had given thanks, he gave it to them: and they all drank of it. 24 And he said unto them, This is my blood of the new testament, which is shed for many." (The Holy Bible; Mark 14:22-24)

the meal. A sacrifice not only had the purpose of honouring the supernatural force or making it merciful but it was also an act of sharing identity among each other and with the deity (Barlösius 1999, Meigs 1988, Neumann 1997, Paczensky and Dünnebier 1994). The sacrifice of the animal led to a sense of guilt, which could only be eased by the participation of all community members (Fieldhouse 1996, Freud 1912–13). Moreover, in the antiquity sacrifices were the only source for eating meat. Slaughtering an animal without sacrificing it was impossible[32]. A sacrifice is always a feast, as a feast cannot be celebrated with out a sacrifice (cf. Freud 1912-13: 419). Similar to the sacrifice of animals is the sacrifice of crops. Harvest festivals are a common ritual in many religions and cultures to thank the deities for the harvest or to make them merciful to supply the worshipers with enough food.

Apart from the function of food in rituals many religions involve food laws. Religious food practices can be characterised as either a prohibition or requirement of specific food for specific occasions. Religion may prescribe what kind of food is allowed and what not, how certain dishes and food have to be prepared, or what has to be observed for the act of eating (Appendix 1). The reasons for food laws and taboos are often inexplicable but usually those food, plants, and animals are affected which have a symbolic character in other cultures. The rules are often used to demarcate the own believes from others respectively have the function to separate one religion from the other and unify the ones who participate (Barlösius 1999, Douglas 1975, Soler 1973). Breaking a taboo or infringing a religious law leads to the expulsion from the religious group and society (Barlösius 1999, Douglas 1975, Freud 1912-13). The Mosaic laws of the Old Testament describe very precisely which food and animals are pure (clean, eatable) and which are taboo (unclean, non-eatable). For example, ruminants with cloven hoofs are eatable while animals just being either one are not clean to eat (cf. Levitikus 11,1-47; Appendix 2). In Judaism apart from the Mosaic laws the Torah contains innumerable dietary directions. Everything 'kashruth' is permitted, while unclean or not properly prepared food is 'trayf'. In Islam the consumption of animals with cloven hoofs and those who chew the cud is lawful ('halal') but pork is not ('haram' – prohibited)[33]. Even contact to pigs has to

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32 This is actually still the ideology in Islam, where an animal should not be slaughtered just for the pleasure of eating meat.

33 "2. 172. O you who believe! eat of the good things that We have provided you with, and give thanks to Allah if Him it is that you serve. 2. 173. He has only forbidden you what dies of itself, and blood, and flesh of swine, and that over which any other (name) than (that of) Allah has been invoked; but whoever is driven to necessity, not desiring, nor exceeding the limit, no sin shall be upon him; surely Allah is Forgiving, Merciful." (Holy Qur'an 2. 172-173)

"5. 3. Forbidden to you is that which dies of itself, and blood, and flesh of swine, and that on which any other name than that of Allah has been invoked, and the strangled (animal) and that beaten to death, and that killed by a fall and that killed by being smitten with the horn, and that which wild beasts have eaten, except what you slaughter, and what is sacrificed on stones set up (for idols) and that you divide by the arrows; that is a transgression. This day have those who disbelieve despaired of your religion, so fear them not, and fear Me. This day have I perfected for you your religion and completed My favor on you and chosen for you Islam as a religion; but whoever is compelled by hunger, not inclining willfully to sin, then surely Allah is Forgiving, Merciful. 5. 4. They ask you as to what is allowed to them. Say: The good things are allowed to you, and what you have taught the beasts and birds of prey, training them to hunt - you teach them of what Allah has taught you - so eat of that which they catch for you and mention the name of Allah over it; and be careful of (your duty to) Allah; surely Allah is swift in reckoning. 5. 5. This day (all) the good things are allowed to you; and

be avoided as they are seen as unclean. In Hinduism the consumption and slaughtering of cattle is restricted and that of other animals discouraged while the consumption of dairy products is allowed. But this taboo does not originate in an aversion towards cows but their holy status in the religion. Under certain conditions the slaughtering and consumption of beef is even 'allowed' and usually practiced by low castes. In Buddhism the slaughtering of living creatures is taboo, therefore, the diet is mainly vegetarian (den Hartog and van Staveren 1995, Fieldhouse 1996, Harris 1990, Kittler 2004, Soler 1973, Tannahill 1988).

Besides the permanent taboos temporary restrictions are also important in most religions (Ramadan, 40-day Great Lent). Fast periods may vary from a few hours up to many days and may involve a complete denial of food or just of certain food categories. The restricted food consumption often aims to cleanse body, mind, and soul and to unify with the deity.

Moreover, celebrations of religious events usually include the consumption of specific food which is special just for that occasion and far from everyday food (e.g. challah as traditional Sabbath bread, kreplach for Yom Kippur, sheep for Id-al-Azah, ghee as a sacred product for many rituals) (Fieldhouse 1996). The preparation of certain food or preparation techniques itself also underlie religious laws[34] as serving and consumption patterns may also be determined by specific rules[35].

Similar to religions many cultures connect specific food to supernatural mystical and magical believes and rituals. Food is alive with feelings and emotions which makes the eating of food an emotional and mystical event. Some food is cultural 'superfood' and worshiped like deities (Fieldhouse 1996). Especially staple food is often referred to as sacred food as it is habitually food which has been indigenous to the culture for a very long time. In many cases staples used to feed the ancestors and therefore are connected to many traditional rituals, gained a high status, and form an integral part of rituals and special occasions (Müller 2003). For example, for the Incas corn as a staple was part of rituals like sacrifices or weddings as a symbol of generosity, strength, or love (Haller 1993). In Papua New Guinea each cultivation step of the staple crop taro (*Colocasia esculenta*)[36] is accompanied by magic. If the crop fails it is explained by either the ritual incompetence of the cultivator or bad magic from an enemy. It is believed that the ancestral spirit lives in the taro so people are very aware of observing the customs and rituals to be rewarded for it (Kahn 1998). In many cultures some food may be

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the food of those who have been given the Book is lawful for you and your food is lawful for them;" (Holy Qur'an 5. 3-5)

34 In Judaism and Islam animals have to be slaughtered according to a specific ritual way otherwise they are unfit to eat. In Judaism the mixing of certain food products and using the same tools for the preparation of different food groups (e.g. milk and meat) is prohibited according to The Holy Bible; Exodus 23:19: "Thou shalt not see the a kid in his mother's milk."

35 According to Islamic norms and traditions eating is only allowed with the right hand as the left hand is considered as unclean and evil. In Hinduism rules exist which define the access to certain food and who is allowed to receive food from whom.

36 Taro (Colocasia esculenta) belongs to the family of Araceae and is an ancient crop throughout the humid tropic and a traditional staple in many cultures. It is grown because of the starchy-rich corms but the leaves are also consumed and are rich in vitamins and minerals.

avoided because they are claimed to have negative or polluting effects on the consumer. Especially those food may be feared which are produced by enemies and unfriendly people. Sometimes the avoidance or taboos just refer to a specific class, sex, or age according to specific circumstances (e.g. pregnancy, lactation, infancy, sickness). Other food may be preferred because they are claimed to have positive or protecting effects. Especially food rich in energy, protein, or vitamins may protect the consumer against evil and illness. Often this food is also claimed to be able to heal, strengthen, or support fertility (Dirar 1993, Fieldhouse 1996, Müller 2003).

3.9 Food, Gender, and Power

Gender plays a role in all food centred activities as gender relations and identities are part of the social and cultural structures. Social structures assign power to women and men through their access and control of resources including food. The ability of women and men to produce, provide, distribute, control, and consume food can be understood as an indicator of their power within the society. This ability depends on their cultural background, strata, family organisation, age, as well as on economic and political structures of their society. Apart from the social power women and men have personal power which may be determined by their relationship to food and their own bodies.

Consumption patterns are often a way to differentiate oneself from others as well as to create identity within the group following the same habits. As one stratum, religion, or culture differs from the other, food patterns of women and men often also make a distinction and reflect and maintain hierarchical structures (Barlösius 1999, Counihan 1998a). The involvement of gender structures in all kind of food-related aspects is very common for most societies. Nevertheless, it can hardly be generalised due to cultural and ideological structures. In each culture some food-related activities, practices, or actions are gender specific. Even if these actions mirror the power structure and hierarchy within society and the power of one over the other, these actions are complementary in most cases and keep the social organisation in balance.

In most societies food production and supply is the complementary task of women and men. The activities are structured by the socio-cultural and ideological environment and background of the society members. For example, in many western cultures the consumption of meat embodies the patriarchal power over animals which is reserved to men and symbolises strength and bravery (Bell and Valentine 1997, Paczensky and Dünnebier 1994, Setzwein 2004, Wirz 1993). By contrast, vegetables are considered as women's food; respectively vegetables are interpreted as femininity and 'weak' while meat is identified with masculinity and 'strength' (Bell and Valentine 1997, Paczensky and Dünnebier 1994, Seel 2004, Setzwein 2004, Whitehead 1994, Wirz 1993). A man consuming female food (vegetables, fruit, or poultry) could easily get the image of being soft and effeminate (Fenton 1997, Wirz 1997). Vegetarianism could be an expression of rebellion against patriarchal power and feminism (Counihan 1998a). Nonetheless, the consumption or preference of meatless food of women does not automatically mean a higher conscious of a healthy diet. Especially in western cultures this behaviour of women is often influenced by socially determined body image of slimness (Setzwein 2004).

In many non-industrial cultures it is common that men are responsible for hunting, breeding of bigger livestock, and agricultural activities calling for physical strength. Whereas women gather wild food, do most of the innumerable agricultural activities, keep smaller livestock, and are responsible for the supply of water and fuel. In some cultures certain food and products are connected to either men or women. For example, for the Wamirans in Papua New Guinea the staple taro (*Colocasia esculenta*)[37] symbolises the children of men and stands for masculinity which creates a symbolic connection between taro and children. In the production of taro male and female activities are clearly structured. The participation of women in the taro production strengthens their position in the economy and culture of the community just like men underpin their importance for the community by their role in reproducing children. This symbolic meaning of taro balances the male and female power in the society (Kahn 1998). In other cultures food may be identified with its producers. The Culina of the western Amazon have strict sexual division of labour concerning food-supplying activities. Men are responsible for hunting while women produce food in their gardens. Therefore, women are identified with vegetables and men with meat (Pollock 1998).

Nevertheless, very often providing food is connected to male power while feeding the family is a female role. This misled view may be explained by the facts that for example in pre-industrial societies hunting and fishing was mainly a male task, most agricultural land is owned by male household heads up to today, modern commercial agriculture and food production are dominated by men, and men usually have higher incomes than women. In many cases men actually even gain more power over food production when traditional production systems change into commercial enterprises. The role of women in domestic food production diminishes with the introduction of cash-economies as the control over money is mainly held by men (Fieldhouse 1996).

Food preparation in most societies is exclusively done by women. Even if men may practice some food preparation this mainly concerns special occasion and is connected to prestige or ceremonial food like meat. By contrast, women do the everyday cooking (Barlösius 1999, Fieldhouse 1996, Paczensky and Dünnebier 1994,). Women are the gatekeepers to the knowledge about nourishment, body, and health (McIntosh and Zey 1998, Wirz 1993). Women hold life-giving power as they bear and raise children and take care of the food for the family. The woman is responsible to supply the family with sufficient meals to keep them healthy and satisfied. In many cases it is the duty of the women to satisfy the desires of the husband or head of the household in the first place and does not cook what she desires most. As these desires may follow strict category thinking it leaves not much freedom of decision for the woman (Charles and Kerr 1988, Whitehead 1994). This power of the man might even be strengthened if the husband is the main supplier of monetary income and budgets the money for food. The husband's control of the money and the dictation of his preferences undermine the woman's role as gatekeeper and therefore her power in food preparation. Therefore, the introduction of cash-economy diminishes the women's power in the family and society since

[37] See reference 36

money also makes a wider range of nourishment independent from the skills and knowledge of the woman possible. Nonetheless, often women are the ones who hold the power over the food as soon as it enters their sphere of food preparation.

Moreover, men have power over women by judging or refusing the cooked food – a form of power women rarely have (Counihan 1998a). However, women also have power over men by preparing food the men do not like, refusing to cook, or by manipulating the status and meaning embodied in food.

In case of food serving and consumption in many cultures men are privileged towards children and women. In most societies rituals and practises of eating follow the hierarchy of the eating group with the top positions usually held by men. For example, in western societies where all food is served in different bowls on the table the men help themselves first and distribute the meat. In some other cultures it is common that men eat first and women and children eat what remains. Especially in case of food shortage the mothers often are the ones who forego food in favour of their family (Fieldhouse 1996, Whitehead 1994). The research of Weismantel (1988) describes the organisation of Ecuadorian families during a meal. All procedures are hierarchical - male before female, old before young, and guest before host. Starting with the seating order the men sit above the ground while the women sit on it. The senior woman sits by the fire and fills the dish in the bowls. By telling a younger woman whom to serve the food she controls the order of serving. She also underlines the social status and hierarchy by the kinds of bowls and spoons she uses, which are different in size, shape, and material. This means that the ones at the top of the hierarchy not only get the biggest portions with the best and biggest pieces of meat and potatoes added to the soup, they also get the biggest, newest, most beautiful bowls and are served first. The serving and consumption of the meal strictly follows the social statuses and hierarchy within the eating group. According to that the senior woman is in absolute control of the food distribution as she decides who gets what, when, and how. That way she is not only in the position to confirm the hierarchy, she also has the power to define the social status of the meal participants. Moreover, this example shows how food pattern create social structures such as hierarchy, status, and gender.

3.10 Psychological Aspects of Food - Food Preferences and Food Choice

People do not eat only to meet physiological need. Food habits are a response to sociocultural needs and norms. However, the desire to eat is also linked to psychological and emotional needs. The basic emotional connections to food develop in early childhood. As soon as an infant is fed for the first time it experiences the pleasure and satisfaction of eating. Food relieves hunger and gives a feeling of well-being and safety. Certain food and tastes are often associated with feelings and emotional experiences as specific food is eaten in particular situations or the consumption is connected to a special event. For example, sweet food is connected with affection, happiness, pleasure, and other positive emotions and events while bitter taste is identified with pain, dislike, and aversion. The emotions may even be linked just to the appearance or the smell of the food (Mintz 1994, Fieldhouse 1996). Food known from the childhood having been cooked by a caring mother or grandmother is usually highly valued and associated with comfort and security. When returning home after a long time a well-

known dish from the childhood will create the feeling of safety, identification, and belonging. People far away from their homes usually desire food they know from home after a while to overcome (conscious or unconscious) homesickness or to awake the feeling of warmth and security of home.

As certain food awakes certain emotions, eating behaviour and patterns also express and reflect the emotional situation the eater is in. For example, a lovesick or nervous person might not like or even be not able to eat. Feeling sick and the absence of appetite make it impossible to consume large meals. Others may eat because of boredom, just to keep busy. In airplanes passengers wait impatiently for the food, as it will pass the time of the flight and reduce boredom. The consumption of sweets and energy-rich food substitutes love and affection and relieves frustration and loneliness. Food can also be a very strong psychological weapon. The rejection of food, not eating at all raises attention and can lead to the control over the other. A child rejecting certain food might achieve control over the parents and someone in a hunger strike can enforce actions by others (Fieldhouse 1996).

Another psychological aspect of food choice is the image of an ideal body. This image is deeply embodied in socio-cultural norms. Especially the appearance of women is often connected to certain standards of the ideal of beauty which influences the eating habits. Not fitting to the image of the ideal body is often accompanied by fears of social disparagement and exclusion (Mennell 1985). Hence, the psychological pressure to follow the social standards might be so strong that it dominates the eating patterns. In many cultures at many times corpulence has been understood as an ideal of beauty while others admire slimness as beautiful. The paintings of the Baroque show naked corpulent and bosomy women. These bodies were highly esteemed and desired by many. A woman who was corpulent had enough good food to eat and embodied high status and wealth (Mennell 1985). In other cultures such as Sudan a married women has to be corpulent. People believe that only big women have enough strength to give birth and to raise many children. It is common to serve brides with very energy-rich food to fatten them (Dirar 1993). In these cases fat and energy-rich food is understood as good and healthy food because it make strong and obese which is an indicator for health and prestige. In other cultures thinness was and is the ideal of beauty. For example, in the bourgeois Europe of the 19th century women had to be slim. Female eating as well as female sexuality were put under taboo and pushed into privacy. Bourgeois women were condemned to idleness and had to be weak, pale, and never hungry for anything. Not being slim would have been a sign of lacking discipline, self-control, and good manners (Wirz 1993). Slimness is therefore often associated with the fear of eating food which causes corpulence. This does not mean that such food might not be eaten but it has to be eaten in moderate amounts or it creates a guilty conscious. In the 20th century the corset was replaced by the dietmania (Mennell 1985). Especially in modern industrialised countries thinness is a high ideal of beauty indicted by not only the fashion but also entertainment and even food industry. Thinness and skinniness symbolises beauty, success, and social advancement. Reaching this ideal body image often leads so far that almost every food is rejected.

Apart from all this some food was often feared and therefore avoided that could cause embarrassing situations in public, for example food that led to bad breath or flatulence (Mennell 1985).

Food preferences are often not only linked to the liking of food. Motivations for preferences can also be nutritional value, convenience, economic factors, or moral. But in most cases people still choose the food they prefer. Like and dislike are influenced by the characteristics of the food itself, the individual eater, and the environment (cf. Fieldhouse 1996: 196). Taste, odour, appearance, colour, texture, convenience, and ingestion are indexes to preferences. People associate food with a whole set of characteristics. To be accepted the characteristics of the food have to match the whole set of indicators[38] (den Hartog and van Staveren 1995, Fieldhouse 1996, Rozin and Vollmecke 1986). The number of taste buds and metabolic and hormonal processes might influence preferences as well as gender, age, experiences, knowledge, symbols, believes, or emotions (Fieldhouse 1996, Rozin and Vollmecke 1986). Moreover, the environmental conditions such as seasonality, daytime, location, climate, the intermediate physical surrounding, or emotional state might determine the preferences. They often stand in a direct contextual relation to a certain environment and surrounding. For example, a person who prefers to eat steak may not eat it in the morning but mainly in the evening. Or, someone prefers a burger but only in context of the atmosphere of a bright fancy fast-food restaurant and not in an expensive restaurant during a candlelight dinner. Sometimes an organically grown vegetable might be preferred over a conventionally grown vegetable even if it has the same gastronomic and economic characteristics (Fieldhouse 1996, Rozin and Vollmecke 1986).

The consumed food often differs from the actual preferences of people. This may be caused by lacking availability, cost, or social courtesy (Fieldhouse 1996, Rozin and Vollmecke 1986). When the preferred food is not available or affordable people choose an alternative product, which they are willing to eat. People might even eat food they dislike if they have no other choice or have to stick to social norms. Therefore, preference is not only a biological decision but also much more a cultural and psychological. Likes and dislikes, preference and avoidance are outcomes of the cultural learning often starting during childhood. Specific rules exist in every society and describe what food is and what is not, what it symbolises, and how the food has to be prepared, served, and eaten. These rules are made according to the sociocultural and religious backgrounds and ideologies. Even if humans like and dislike food because of the flavour, it is not relevant if the culture says it is not fit to be eaten.

[38] For example, does a food have the right odour and taste but a wrong colour it is very likely to be rejected.

4 Concept of the Cycle of Meal

The human diet, as central element of cultures, is embedded in the dynamics of the natural and the cultural system. The previous chapters showed that food culture interacts with various factors within a dynamic and non-final natural and socio-cultural environment. Even though the factors were described separately for an easier understanding, it is obvious that these factors are interdependent. It is impossible to attribute one process to just one cause. Natural and cultural processes are integrated into a web of interdependent procedures with various influences and impacts. Looking at only one single aspect that interacts with food habits would create a very incomplete picture. Fading out the interdependence of natural and socio-cultural aspects excludes influences, causes, and explanations which are essential to understand social and cultural behaviour.

To develop an approach, which examines the food culture of a society, it is necessary to take the interdependence of these factors into account. While nature builds the fundament for food cultures interactive elements of the culture shape the food habits by influencing the human behaviour. Besides that, food habits are a result of the interactions between the human and its natural and cultural environment through communication, co-operation, and accommodation. Therefore, the aim is not only to realise and describe the food culture but to understand it in its natural and socio-cultural context and as a mirror of the society.

The model of the cycle of meal (Figure 6) is structured into seven interdependent natural and cultural spheres: nature, technology, economy, politics, social organisation, religion/ norms, and psychology. Splitting up nature and culture into separate elements does not mean that one sphere just operates on one level and the other one on another one. All spheres are understood as parts of a holistic system without any hierarchical order. Whereas the importance and weighting of the different factors is non-static and depend on the given situation. Depending on the arrangements and the dynamics within the society the spheres act differently with different prioritisation. This makes it impossible to generate one universal theory. The spheres are much more a flexible and accommodatable web which in reality cannot be taken apart. The elements build a complex framework and the spheres are interdependent and in permanent interaction and are only described and analysed separately for an easier understanding.

Nature is understood as the material fundamental element of food cultures. The natural system includes the bio-physical environment as well as the human being as a living creature with physiological needs and metabolic processes. Nature supplies the human with resources (e.g. food, water, soil, fuel) which he uses to secure his existence. The human understanding of nature reflects in the way the society behaves towards the ecological environment. Securing the subsistence is an arrangement between culture and nature, as a destruction of nature destroys the basis of existence for the society and its culture. Nature is not detached from the cultural system which consists of the other six spheres (technology, economy, politics, social organisation, religion/ norms and psychology). Nature and culture are interactive dimensions within one system with the human behaviour and acting as the connecting link and the human

being as a natural and cultural being (cf. Duncan, Fischer-Kowalski, Park, Steiner, Steward, Teherani-Krönner).

Depending on the socio-cultural structure humans deal with the natural environment and make use of the natural resources through technologies to satisfy their needs and desires for existence which includes food. Technologies are influenced by the knowledge and the cultural development of the society. They are developed to fit into environmental conditions but much more to satisfy the social and cultural desires. Therefore, technology can be described as the tool that serves the human to connect the natural and cultural systems.

The development of food cultures is shaped by the cultural elements such as economy, politics, social structure, religion/ norms, and psychology as they influence the cultural behaviour. Even if these elements directly and indirectly interact with the natural environment they result from socio-cultural behaviour and cultural evolution based on the instrumental, communicative, and accommodative behaviour of the human. The economy reflects for example in the production system, prices, trade, transport, and income. Politics interact with food patterns through agricultural policies, price and market controls, nutrition and health programs, or strategic marketing of food enterprises. Social structures are demonstrated by the status and prestige of as well as the identification with food patterns. Moreover, gender, generational, and ethnical relations play an important role while food habits are also a central mean of communication. Religions and norms define food acceptability and food behaviour. The psychology or individual choice (preferences, taste, personality, beliefs) can be described as the result of individual characteristics in combination with the previous factors.

The cultural elements show that foodways are more than just a biological process to satisfy physiological demands. Socio-cultural structures and characteristics of a society have a significant impact on shaping food patterns as well as food patterns determine the society. This also means that food cultures not only result from the utilisation of the natural environment and through the use of technologies but also develop from certain economic, political, social, normative, and psychological structures of the society. Therefore, food cultures are open systems and results of the interactions between the different natural and cultural elements and the ability of the individual to interact with both spheres.

Foodways, as culture itself, are not a static fact. Food patterns involve changes. Everyday learning, experiences, and new knowledge cause changes in activities, skills, behaviour, attitudes, symbols, and meanings. Each generation, although it learns the culture it is born into, never is the accurate image of the previous one. Even if traditions are preserved they are also assimilated in the procedures of change. Therefore, food habits have to be understood within a concept of change, exchange, and communication due to accommodation. As part of the culture they are located within dynamic accommodative processes. On one side, it often seems that food habits form a stable and constant determinant but on the other side, changing food habits also mark continuous or rapid and significant cultural changes. However, changes only occur if they fit into the socio-cultural framework of the society. Otherwise, changes have to mark a notable advantage or profit for the society without leading to significant conflicts.

To understand the food culture of a society, apart from looking at natural and cultural spheres, it is necessary to examine the cycle of a meal from the production of food until the consumption of a meal. Therefore, the inner part of the cycle of meal is divided into the following procedures: food supply, food processing, meal preparation, meal serving, and meal consumption. The procedures influence each other and each procedure has to be seen in the context of the natural-cultural web. The outcome of the procedures is the result of the interaction with different natural and cultural elements with a special (economic, political, social, symbolical, normative, or physiological) meaning for the consumer (cf. Teherani-Krönner 1999: 206-210).

Food can be associated with unprocessed raw products, which may be natural or artificial and not ready to eat, it also could be a dish ready to eat. The term meal, however, describes a cultural product. The meal is not only a food product, a dish, or the act of eating. Meal is the concept of preparing a dish from different natural or artificial products, setting it up, serving, and eating it. Each procedure and activity to complete the meal is culturally determined, as there is no culture-free food or good. Dealing with and consuming a meal is not dealing with a matter but with a cultural meaning. It is not the natural product humans eat but the cultural product filled with meanings and symbols. Consequently, the cycle of meal has to be understood in its socio-cultural context.

Figure 6 shows the cycle of meal with the food habits embedded in the web of the natural and cultural spheres. The cycle of meal describes all procedures creating a meal from the production of the raw product to the consumption of the prepared and served meal. To understand the food behaviour of cultures, and therefore their food habits, it is necessary to look at all these steps in its entirety, their interdependence to each other, and their interactions with their natural and cultural environment.

The food supply is the procurement of the food in form of production or purchase. This might be the process of agricultural and agricultural related activities including production factors. In case of purchase, it is the way of receiving the food through exchangeable matters within a market structure. The procedure of food supply also includes elements like access to and availability of resources, markets, and infrastructure. The food supply is closely connected to cultural elements. Even though it often seems that in agricultural societies the food supply is much more connected to natural processes. Nevertheless, the natural resources are also utilised according to cultural factors. For example, humans living in agricultural societies depend on domesticated plants and animals and use tools for the agricultural activities. They do not sustain on wild plants and wild animals like gatherers and hunters' societies. Thus, the food supply is guaranteed through the modification of natural elements through technologies which depend on the cultural development. Therefore, domestication and the use of agricultural tools is a product of the cultural evolution. The cultural influence becomes even clearer in the case of food purchase as factors such as economy and politics may determine the availability of products and the possibilities of the consumer.

Food is often produced for a later use to guarantee a stable food supply or to overcome seasonal gaps. Therefore, it has to be stored. Some products are stored the way they are but many

are in some way processed and preserved to increase the durability or to make them storable at all. There is only little food that can be stored without any preservation or treatment. For example, cassava is best stored by not harvesting it. Just leaving the roots in the soil guarantees their durability. However, many food products (e.g. cereals, vegetables, fruit) have to be stored in a specific way (e.g. specific temperature, humidity) to avoid spoilage. Moreover, many products cannot be stored at all or only for a short time in an unprocessed state and therefore have to be processed. Preservation methods of food have often been known for thousands of years and were already practiced by many ancient cultures. Some preservation methods such as drying, fermentation, and pickling are simple processes which do not require complicated technologies and can be done on household level. Others require complex technologies and are mainly done on industrial level such as canning, pasteurisation, freeze-drying, irradiation, vacuum packing, and artificial freezing. Even if some conservation methods are natural processes most modern methods are highly technologised and are used by human societies to serve their cultural needs.

Even though food products themselves and the procurement of food are connected to a huge number of socio-cultural factors, the preparation of food into a dish and a meal is a central cultural element of food habits. The transformation of a raw natural product into something edible can be understood as the culturisation of nature[39]. Through preparation nature is transformed into a cultural element loaded with norms, symbols, and emotion. The preparation of dishes is hardly bound to any natural features but offers a many opportunities for cultural creation and production. Several food products cannot be eaten raw without taking any physical harm but this does not explain the variety and variation of preparation methods. Not the natural but the socio-cultural characteristics determine preparation technologies (cf. Barlösius 1999: 38-40). Knowledge and skills to prepare food are a cultural heritage as are certain meals in every culture. It is the art of unifying and harmonising all kinds of different cultural directions into one object. The skills and knowledge to prepare a meal are a result of experiences and observation and often transmitted from one generation to the next.

Lévi-Strauss' 'culinary triangle'[40] tries to structure food by comparing nature and culture, prepared and unprepared (Böhmer-Bauer 1990, Lévi-Strauss 1968, Mennell 1985, Tanner 2002). He considers the art of cooking (or better: food preparation) as major aspect of the

[39] Nevertheless, domestication can also be seen as a cultural transformation as plants and animals are selected, bred, and grown under use of certain technologies under the influence of socio-cultural parameters to provide a certain raw food product for human nourishment. Even the use of natural/ raw products requires experiences and knowledge about the products and is therefore connected to culture.

[40] Lévi-Strauss categorises food into raw, cooked, and rotten and claims these categories are cross-cultural alike. "… the cooked is a cultural transformation of the raw, whereas the rotten is a natural transformation" (Lévi-Strauss 1968: 29). While both – cooked and rotted food are prepared, only cooked food is identified as culture. Lévi-Strauss himself describes this concept as vague and generalised as the meanings for raw, cooked, and rotted are not the same in every culture. Even raw eaten food undergoes in most cases a process of preparation as well as the process of rotting is somehow controlled. "In any cuisine, nothing is simply cooked, but must be cooked in one fashion or another. Nor is there any condition of pure rawness: only certain foods can really be eaten raw, and then only if they have been selected, washed, pared or cut, or even seasoned. Rotting, too, is only allowed to take place in certain specific ways, either spontaneous or controlled." (Lévi-Strauss 1968: 29)

civilisation of a society (Counihan 1999, den Hartog and van Staveren 1995, Lévi-Strauss 1968). The preparation of meals is the medium through which culture articulates with all its meanings and symbols.

However, food preparation is not only understood as the process of cooking but includes actions such as cleaning, chopping, grinding, and seasoning. Literally, all activities that somehow are involved in the preparation of a meal are part of the process. The methods of food preparation are diverse and numerous. They are not only corresponding to the available food, but also to the cultural norms and needs, the individual preferences, knowledge, skills, and attitudes towards food and preparation. For example, two households of the same social and cultural background will probably prepare the same dish (e.g. potato soup) from the same ingredients in a different way. Both might clean and chop the ingredients differently, add the ingredients in a different order, vary in cooking time, or the way of steering. One household might have a potato soup with big chunks of potatoes and additional ingredients with a clear stock. The other household might have a creamy potato soup everything mixed like a purée.

The setting up and serving of meals is also a highly culturised process. A meal is set in line with certain cultural and social standards according to the prepared dishes, the participants, and the occasion of the meal. The serving of a meal is therefore not only an arrangement of the dishes themselves but reflects the social and cultural situation of the eaters. The kind of food and drinks and the order in which the participants of the meal are served often describes and determines the hierarchical structures of the group and the status of the members within the group. The combination of dishes and the order in which the dishes and courses are served create a clear structure which generates comfort and familiarity. A change or mixing up the serving orders could lead to individual and social confusion and conflicts. Moreover, the setting of the meal mirrors the significance of the occasion. In all kinds of cultures people not only separate between food for everyday and special occasions. The set up of the meal is at least as important. Most households have crockery for daily use, special weekdays, and maybe another set for special events. A certain dish or composition of dishes alone does not make the occasion but the way of setting it up. For example, a simple dish such as a potato soup gives a very different expression being served within the cooking pot and eaten from ordinary plates with metal spoons or being severed in a tureen of china, set on a table covered with a nice tablecloth eaten from best china with silver spoons. This will not only create different emotions, the same soup might even taste differently.

Every culture describes not only the food which can be consumed, how it has to be prepared and served but also how it has to be eaten. Cultural norms often define, in form of table manners, the behaviour during the meal consumption. The consumption as final act is the climax of a meal. The act of eating is a physiological, emotional, and cultural satisfaction. While all previous procedure dealt with natural, social, and cultural elements, the consumption of a meal can be understood as assimilation of the natural and especially the cultural sphere. Humans need to eat to survive. The food is needed to satisfy physiological needs. However, in no culture humans eat food only to satisfy their physiological demand. If it were like that, they could just eat everything non-toxic found in the nature. Humans hardly eat any raw and unprepared products. Humans eat to satisfy their cultural, ideological, emotional, and sensu-

ous desires. Food is not only consumed for subsistence of the body. It is also nutrition for the heart, mind, and soul. A meal is a cultural creation. It is a reflection of social and cultural characteristics and psychological and emotional situation of the individual which makes it to a very intimate event. All previous procedures are bound to cultural behaviour and are practiced to serve one goal – to assimilate and to absorb the culture through the act of eating. To eat this cultural production according to the given norms, regulations, and believes indicates the acceptance of and identification with the culture. Literally, it makes the consumer an active part of the culture.

All this has also to be considered discussing the problem of food security. Food security is not reached by producing enough food, satisfying the market supply, or guaranteeing everybody access to food products. Food security is reached when food is eaten and if this consumption was possible within the given socio-cultural settings. To emphasise the importance of the fact that only the consumption of a culturally bound meal leads to the satisfaction of the demands and desires of human beings the term 'food security' will be changed into 'meal security' (cf. Teherani-Krönner 1999: 206).

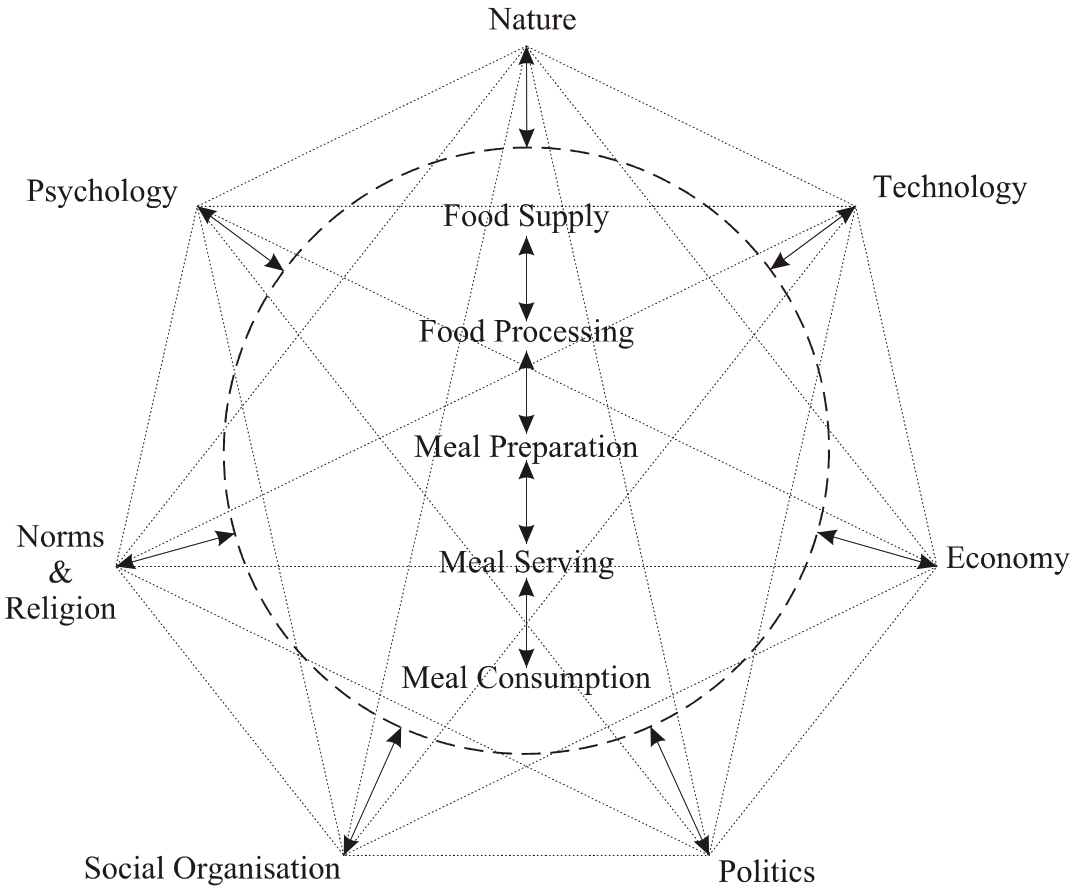

Figure 6: The Cultural Ecological Cycle of Meal

Part II: Cultural Ecological Research of Food Habits

Food Culture and Meal Security in El Obeid, Sudan

5 Sudan – A Country Review

5.1 Geographic Description and Topography

The Republic of Sudan is located in northeastern Africa (Appendix 3/map1) and with an area of 2.5 million square kilometres the largest country in Africa (CIA 2005, FAO 2002b, 2003a). The landscape of Sudan is mainly a flat sedimentary plain with low plateaus with elevations between 300 to 900 metres. Only a few highlands and grouped hills can be found in Sudan. These highlands include the Red Sea Hills in the east, several mountain formations in the very south with the highest peak of Sudan, the Mountain Kinyeti (3,197 m), the Nuba Mountains in Central Sudan and Jebel Marra in the West (CIA 2005, FAO 2002b, 2003a).

Sudan is dominated by the River Nile. It runs across the country from the south to the north. The Nile Valley covers an area of about 25,000 square kilometres (Sudanmfa 2004).

The wide territory of Sudan makes it to a country of topographic variety, diverse ecologies, and natural resources. The area of Sudan consists of various soils. Yermosols are the most common soil type in the desert (arid regions) in the north of Sudan. This area usually has no vegetation cover and its characteristics are bare rocks or mobile dunes (FAO 2002b, 2005a, Mitchell 1991). Some areas in the south of that zone might support the growing of juicy plants suitable for camel grazing (FAO 2002b, 2005a, Mitchell 1991). Xerosols and Arenosols are characteristic in the semi-desert of North and West Sudan. These soils have a low fertility but Xerosols are able to develop some organic matter in case of higher rainfall. Arenosols have a high saline and Xerosols a high sodium saturation which demands for special drainage and soil management in any case of irrigation (Mitchell 1991, Pagel 1981). These soils are usually used for extensive grazing of camels, sheep, and goats and the cultivation of rainfed sorghum (*Sorghum vulgare* or *bicolor*), millet (*Pennisetum glaucum* or *typhoides*), groundnuts (*Arachis hypogaea)* and sesame (*Sesamum indicum*) (FAO 1988a, 2002b, 2005a, Mitchell 1991).

Vertisols, also known as cracking clays, are found in the Nile Valley in semi-arid, sub-humid, and humid regions. The clay content is very high (50 to 60 per cent) but the content of organic matter is low. This soil type is suitable for mechanized and irrigated farming with crops such as cotton (*Gossypium hirsutum*), sorghum, and gum arabic (*Acacia senegal*) (FAO 2002b, 2005a, Mitchell 1991, Pagel 1981, Sudanmfa 2004).

Table 1: Basic Facts of Sudan (AFDB 2003, BRS 2005, CIA 2005, EIA 2004, FAO 2002b, 2003a FAOStat 2006, Nohlen 2000, UNICEF 2004, WFP 2004b World Bank 2006a, 2006b)

Geography	
Area:	2,505,810 sq. km
Location:	Between latitudes 3° 53' and 21° 55' N and longitudes 21° 54' and 38° 31' E
Borders:	Egypt (north); the Red Sea, Eritrea, Ethiopia (east); Kenya, Uganda, the Democratic Republic of Congo (south); the Central African Republic, Chad, Libya (west)
Relief :	Flat sedimentary plain with some highlands and grouped hills
Highlands:	Red Sea Hills (up to 1,500 m); Lotuke, Dongotonia, Imatong, and Ingessan Mountains (up to 3,000 m); Nuba Mountains (up to 1,500 m); Jebel Marra (up to 3,000 m); highest peak of Sudan: Mountain Kinyeti (3,197 m)
Mineral resources:	Oil, manganese ore, calcium sulphate, tungsten, kaolin, asbestos, chrome, magnesium, talc, copper, gold, pyrite, marble (East); gold, asbestos, beryl, marble, manganese ore; fluorite (North); lead, zinc, iron, sodium, copper, uranium, diamonds (Darfur); oil, gold, marble (South)
Population	
Population:	40.17 million (est. 2005)
Population growth rate:	2.6 per cent (about 5 children per women)
Life expectancy:	58.54 years (female: 59.8 years, male: 57.33 years)
Age structure:	0 - 14 years: 43.2 per cent 15 - 64 years: 54.5 per cent 65+ years: 2.4 per cent
Literacy rate:	Total population: 61.1 per cent (male: 71.8 per cent; female: 50.5 per cent)
Religion:	Sunni Muslims: 70 per cent; traditional religions: 25 per cent; Christians: 5 per cent
Economy/ Agriculture	
GDP:	US$23,2 billion (2005 est.)
GDP real growth rate:	6.4 per cent (2004 est.)
Average annual income per caput:	US$640 (2005 est.)
External debts:	US$26 billion (2004 est.)
Industry:	Crude oil production and refining, sugar industry, cotton ginning, textiles, cement, edible oils, gum arabic
Agriculture products:	Sorghum, millet, gum arabic, sesame, groundnuts, cotton
Export products:	Crude oil, sheep, sesame, groundnut, gum arabic, cotton
Import products:	Wheat, foodstuffs, manufactured goods, refinery and transport equipment, medicines, chemicals, textiles
Arable land:	Total: 84 million ha Utilised: 17 million ha (est. 2004) irrigated: 1.7 million ha mechanised rainfed: 6 million ha traditional rainfed: 9 million ha
Rangelands:	24 million ha
Forest and woodlands:	86 million ha

Nitosols and Ferralsols are the common soil types in the humid regions. Nitosols are characteristic for the hilly areas with dense bush lands in the south and southeast of Sudan. Ferralsols are mainly found in the south and southwest of Sudan. They are characterised by low fertility and quick deterioration, therefore shifting agriculture is the best method for cultivation (FAO 2002b, 2005a, Mitchell 1991, Sudanmfa 2004).

In the mountains and hill formations hill soils are common. They are fertile volcanic soils. In Jebel Marra in Darfur the soil is very fertile and in combination with the distinctive climate a specialised agriculture/ horticulture has developed which differs from other parts of Sudan[41]. Fluvisols are found in the alluvium along the Nile and his tributaries as well as along major watercourses and swamps in the South. This is a very fertile soil since its sedimentary silt is renewed annually (FAO 2002b, 2005a, Mitchell 1991, Sudanmfa 2004). Sedimentary rock and sandstone formations, which are found in wide parts of the North and West, are good indicators for the existence of crude oil and ground water (BRS 2005, CIA 2005).

5.2 Ecological Zones and Water Resources

Sudan has a wide range of tropical continental climates (Table 2, Appendix 3/map 2) which can be roughly separated into three main zones. The region north of latitude 19° N is mainly arid desert. The central part of Sudan is characterised by semi-desert in its north and low-rainfall savannah in its south. The south of Sudan is dominated by tropical wet-dry climate with high-rainfall savannah and rainforest. Within the different climatic zones in some areas climatic differences and specific features appear. The climate of the far south/ southwest is tropical rainy climate. In the South along the rivers swamp is found - the Sudd which is one of the biggest fresh water swamps in the world. The Red Sea area differs from the rest of Sudan by having arid Mediterranean climate with winter rains. In general, Sudan is dominated by tropical climate with monthly mean temperatures far above 18 °C (annual average temperature 26 to 32 °C). Exceptions are mountain regions of higher altitudes with a slightly lower annual average temperature between 18 and 23 °C (Bebawi and Neugebohrn 1991, FAO 2002b, 2003a, Walsh 1991).

There is a large variation in the annual rainfall according to the climatic conditions (Table 2). In the desert it is less than 50 mm per year. Southwards of Latitude 19° N the rainfall increases from 75 mm up to 1,400 mm in the very south and southwest, where the cultivation season reaches around six months. The rainy season during the summer lasts depending on the change of climate from two months between July and August (North) up to six months from May to October (South). The rest of the year is dominated by dry and hot climate. Rainfalls in winter only occur along the Red Sea coast (Bebawi and Neugebohrn 1991, FAO 2003a, 2005a). Also, Jebel Marra has higher rainfalls (up to 1,000 mm) than the rest of the West. Due to increasing desertification the rainfall period in many areas of Central Sudan is very erratic and has decreased within the last decades to about two to three months.

[41] Apart from seasonal rain many mountain valleys have sources of permanent water. Under irrigation in the relatively cool climate many different vegetables, fruit, tree fruit, sorghum, and millet are grown.

Table 2: Ecological Zones of Sudan (according to FAO 2002b and Walsh 1991: 21)

Climatic type	Annual rainfall (mm)	Wet season	Other climatic characteristics	Agriculture
Tropical continental desert	<75	July to September	Relative humidity <40 per cent. Very short wet season during summer in south. Large diurnal and annual temperature range.	Nomadic pastoralism. Cultivation only via irrigation along the Nile and Atbara.
Red Sea desert	<200	July - September and November - January	Relative humidity >40 per cent throughout year. In winter rainfall maximum. Smaller temperature ranges.	Nomadic pastoralism.
Tropical semi-arid (semi-desert)	75 - 300	July - September	Highly variable annual rainfall.	Widespread cultivation by dry farming, but frequent crop failures. Irrigated agriculture, pastoralism.
Tropical sub-humid (low rainfall savannah)	300 - 800	May - September	More reliable annual rainfall.	Widespread cultivation; more reliable crop production. Traditional rainfed cultivation, irrigated agriculture, pastoralism, forestry. Major zone of mechanised farming.
Tropical wet-dry (high-rainfall savannah)	800 - 1,500	April - October	Long dry season and long wet season.	Traditional rainfed cultivation, mechanized farming, pastoralism, forestry.
Wet tropics (tropical rainy)	>1,200		Short dry season. Warmest months in winter (dry season). Very low annual temperature range.	Maize, eleusine, coffee, tea, plantations. Some fruit of the wet tropics in the mountains.
Jebel Marra	>500	May - September	Mean annual temperature <25°C. High diurnal range. Increase in rainfall with higher altitude.	As sub-humid climate, but also citrus and tree fruit, vegetables, pastoralism.
Flood region	600 - 1,000	May - October	Long dry season and long wet season.	Traditional cultivation, pastoralism.

The trend of declining annual rainfall in the semi-arid and sub-humid zones has been noted since 1965. Since then the desert zone has advanced and the semi-arid and sub-humid zones have moved southwards continuously (Ahlcrona 1988, Walsh 1991). In the last 40 years two major periods of drought occurred, one between 1965 and 1973 and the other between 1980 and 1984 (Ahlcrona 1988, Walsh 1991) with disastrous damage to the environment, social structures, and economy.

The main water supply of Sudan depends on the Nile and its tributaries. Away from the rivers the water supply depends on seasonal watercourses and in some areas on groundwater. The use of stream water is limited to the wet season. For the dry season water storage strategies are needed. Traditionally, surface pools along the seasonal watercourses play an important

role. In some areas the stem of the tabaldi tree (*Adansonia digitata*) is used for water storage which can hold 1,000 up to 9,000 litres. More modern water collection strategies are the construction of hafirs (excavated reservoirs). A hafir usually has a capacity of 10 to 15,000 m^3. But evaporation and therefore the losses of water are very high and the supply rarely last for the whole dry season. Hafirs are also breeding places for mosquitoes and increase the risk of malaria. Furthermore, they can easily be destroyed in case of inadequate management (Walsh 1991). Another method for water supply is the digging of wells. Wells can be permanent or seasonal and the depth can vary from a few to more than a hundred metres depending on the mother stone and geological characteristics. Even if it is more expensive and complicated to dig deep wells, these are more reliable and independent from seasonal rainfall. Besides this deep wells are more resistant to pollution and contamination (Walsh 1991).

5.3 Population

The Population of Sudan is about 40.17 million (CIA 2005, WFP 2004b). About 60 per cent of the population live in rural areas (AFDB 2003, FAOStat 2006). The highest population density is found in the Nile Valley and especially in the region of the Nile's confluence (Appendix 3/map 3). Still, the majority of Sudanese lives in rural areas but the migration to urban areas has highly increased over the last few years. While in the late 1990s about 75 per cent of the population lived in rural areas it is estimated that in 2030 60 per cent of the population will live in urban areas (FAOStat 2006). The population growth rate is estimated at 2.6 per cent. The life expectancy is 58.54 years (CIA 2005). About 43 per cent of the population are less than 14 years old (CIA 2005). The large share of young population is a burden on social services and the economy of Sudan. They depend on the care, support, services, and economic activities of the adult and working group[42]. The neglect of the young generations could cause an economic and social damage to the whole society in the future. Nevertheless, the young population has a big development potential in terms of labour market and human capital for the next few decades. This surely demands sufficient educational and social support, food supply, and care taking in the present and near future.

More than 500 different tribes live in Sudan. They speak more than 100 different languages which mainly belong to the Nilo-Saharan languages, but the official language is Arabic. About 40 per cent of the Sudanese population belongs to Arab tribes. Furthermore, in northern and central regions many ethnical groups live according to Arab traditions. About one third of the total population lives in the southern parts. Their way of life, cultures, and traditions are quite different to the northern ones (BRS 2005, CIA 2005, Nohlen 2000).

History, Political Situation, and Administration of Sudan

The history of Sudan started in the Palaeolithic Age. The first known settlements of hunters and gatherers between Wadi Halfa and Khartoum are dated about 5,000 BC. The transition to agriculture and stockbreeding was about 4,500 BC, in the Neolithic period. Archaeological

[42] About 54 per cent of the population are 15 to 64 years old (CIA 2005).

findings prove the beginning of advanced civilization and the connection of Nubia to the powerful Egypt Kingdoms. From about 3,500 BC the ancient Nubia was controlled by many kingdoms. About 2,000 BC the Egyptians started to colonise Sudan up to the Fourth Cataract and established the Kingdom of Kerma. It fell about 1,500 BC through troops of the 18th Egyptian dynasty of pharaohs. In the 11th century BC the power of the Egyptian Empire declined and the Egyptians left Nubia (BRS 2005, ERSL 2005, Streck 1982).

At the end of the 9th century BC the Kingdom of Kush[43] was established, which can be divided into two periods: the Kingdom of Napata (about 850 to 300 BC) and the Kingdom of Meroë (about 300 BC – 350 AD). In 900 BC a Nubian kingdom arose in Napata. About 760 BC the kings of Napata conquered Egypt and established the 25th dynasty of the rulers of Egypt. About one hundred years later the Assyrians drove the Nubian rulers out of Egypt but their descendants continued to rule in Nubia for another thousand years. Have been the rulers of Egypt for one century they followed mainly Egyptian traditions which included the hieroglyphic writing. With the establishment of Meroë as the capital the citizens started to build big towns and temples. A new writing was established which still is not decoded up to the present. The Kingdom of Meroë was destroyed by the Axurnites but they did not permanently occupy Nubia. After the end of the kingdom of Meroë the territory of Sudan was divided into three kingdoms: Nubadia with its capital Faras, Maqarra with its capital Dongola and Alwa with Soba (BRS 2005, ERSL 2005, Streck 1982).

About 540 AD during the reign of Justinian, Sudan was Christianised. In the 7th century Nubadia and Maqarra united to become a Christian kingdom which existed until the 14th century. The Turkish rulers of Egypt succeeded to overthrow the Maqarran dynasty in 1340. This was followed by the immigration of Arab tribes which moved into the country about the middle of the 15th century. Finally, the kingdom of Alwa, which had survived longer, was overthrown and Islam became the dominating religion of Nubia. After the breakdown of the Christian kingdoms the Islamic Sultanate Funj with the capital Sennar was established. At the height of their power the influence of the kingdom of Funj extended, from the Third Cataract in the north to Fazogli in the south. Even Kordofan was ruled by the Funj for a few years in the second half of the 18th century. The Sultanate can be compared to a feudal confederation. The land was parcelled out among local leaders who enjoyed considerable independence. Eventually, the failure to build up a centralised administration and the weakness of the royal house itself brought the collapse of the kingdom. At the end of the 18th century one after the other the chieftains revoke their allegiance to Sennar (BRS 2005, El-Mubarak 1986, ERSL 2005, Streck 1982).

By 1820 the authority of the Funj scarcely extended to the north of Khartoum. The Sultanate Funj broke down with the invasion of the Egyptian ruler Muhammad Ali Pasha in 1821 and the annexation to the Ottoman Empire. Thus began the period of Turko-Egyptian rule in Su-

[43] Some sources give slightly different naming. Therefore sometime the kingdom of Kush is named the kingdom of Meroë dated from about 750 BC to 350 AD with the first capital Napata and the second capital Meroë.

dan, which lasted until 1885. Khartoum was established as the capital and the country was divided into provinces and districts. The time of the Turko-Egyptian rule was characterised by the exploitation of Sudan. During those times the slave trade between Sudan and Egypt was prospering. High taxes, exploitation of natural resources, and destruction of the economy gradually led to rebellions and bloody clashes between Sudanese citizens and the Turko-Egyptian government. With the opening of the Sues channel (1869) Sudan was more and more influenced by European culture. In 1874 the king of Egypt appointed Colonel Charles George Gordon to administer Sudan (BRS 2005, El-Mubarak 1986, ERSL 2005, Streck 1982).

In 1881 Mohamed Ahmed Al Mahdi led a revolt against the government. His rebellion triumphed with the capture of Khartoum, where Colonel Gordon, the last Turko-Egyptian governor was killed in 1885. On the advice of the British, who occupied Egypt since 1882, the Turko-Egyptian government was withdrawn. Although the Mahdi died the same year, Sudan remained independent until 1898 under his successor Khalifa Abd Allah. During that time Omdurman was the Capital.

An Anglo-Egyptian force invaded Sudan between 1896 and 1898. The new occupant established a new system after the rule of the Mahdi which was marked by the dislocation of Sudanese economy and tribal life. The system of the Turko-Egyptian administration was reintroduced. The structure of the government of Sudan was defined in the Condominium Agreement between Britain and Egypt in 1899. This agreement enforced the separation of the administration of Sudan from that of Egypt and put Sudan under joint Anglo-Egyptian control, with predominant British influence. The British politics as the administration system of indirect rule, the establishment of large cotton plantations, building of the railway, and the political and cultural separation had a strong influence on the further development of Sudan (BRS 2005, ERSL 2005, Streck 1982, Sudanmfa 2004).

On the 1st of January 1956 Sudan was declared independent. However, with the independence two parts of the country were united which economically, culturally, and politically were very different. Since independence Sudan underwent several systems of national governments ranging between military and civil rule. In 1958 the armed force staged a coup and a military government under General Abound came to power until 1964. When an uprising took place and he had to resign, a civilian elected government was brought into power. In May 1969 another coup took place and by military forces General Numeiri became the head of state. All political parties were prohibited and the only legal party was Numeiri's 'Sudanese Socialistic Union'. Granting the autonomy for southern Sudan Numeiri finished the longstanding conflict with the south of the country. Increasing tension and ongoing Islamisation once more led to the outbreak of civil war between the central government and the southern rebels, and to the overthrow of Numeiri. The Sudanese Socialistic Party was dissolved and in 1986 a democratic civilian government was elected under the chair of Sadig al Mahdi. The attempts to end the civil war and to rescind Islamisation did not succeed. After another military coup in 1989 the National Salvation Revolution was declared and a pro-Islamic military government under the lead of General Umar Hassan Ahmed al Bashir was established (BRS 2005, ERSL 2005, Nohlen 2000, Streck 1982). With the appointment of al Bashir as president the military gov-

ernment formally ended, since than al Bashir was elected twice in 1996 and 2000. All popular opposition parties boycotted elections because of a lack of guarantee for a free and fair election. The government is now run by the National Congress Party (NCP), formerly the National Islamic Front (NIF).

The Republic of Sudan has adopted the federal system as basis of government with a president as its head. The country is divided into 26 states[44] (*wilayat*) and each state is divided into several localities (*mahaliyaat*) which total to 120. The executive branch is formed by the prime minister as head of government and the council of ministers (cabinet) which are appointed by the president. The president also appoints the states' governors. The National Assembly and the president as the chief of state constitute the highest legislative body. Both positions, the one of the president and the one of the prime minister, are held by Umar Hassan Ahmed al Bashir. The Supreme Court and the Special Revolutionary Courts built the judicial branch. The legal system is based on the English common law and the Islamic law (CIA 2005, ERSL 2005, SIG 2005).

With the introduction of the ideology of an Islamic nation since 1983 and especially since 1989 the Islamisation of Sudan has had a very strong impact on public, social, political, and state life and all its institutions. The Islamisation is not only based on the religious ideology but has to be understood as a political attitude and a way of life which applies to the whole nation and everybody. The goal of NCP is the creation of an Islamic nation (umma) which not only dominates the religious ideology but the social and public life to reach cultural homogeneity and national identity. To establish the umma, Islamic norms are introduced. These include the Islamic law (*sharia*), alms tax (*zakat*[45] – replacing the income tax), outlawing of financial practices like charging interest by Islamic banks, giving strict regulations about the (especially female) dressing and appearance in public, and dividing public space by gender. The goal of the Islamisation is to transform the nation and society following the Islamic ideology. This includes the control of public spaces, of social and political activities to oppress traditional, indigenous, and individual actions which would disturb the Islamic moral and the establishment of the umma (Beck 1998, Hale 1997, Nageeb 2004).

In January 2005 the peace agreement between the central government and the South Sudanese rebellion organisation SPLM/A (Sudanese People's Liberation Movement/ Army) was signed after more than twenty years of civil war. It mainly regulates the sharing of the income of crude oil and made John Garang[46], the leader of the SPLM/A, the vice-president of Sudan. After the time of six years it will be decided if the South becomes an autonomous country with its own administration.

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[44] The states are: A'ali an Nil, Al Bahr al Ahmar, Al Buhayrat, Al Jazirah, Al Khartum, Al Qadarif, Al Wahdah, An Nil al Abyad, An Nil al Azraq, Ash Shamaliyah, Bahr al Jabal, Gharb al Istiwa'iyah, Gharb Bahr al Ghazal, Gharb Darfur, Gharb Kurdufan, Janub Darfur, Janub Kurdufan, Junqali, Kassala, Nahr an Nil, Shamal Bahr al Ghazal, Shamal Darfur, Shamal Kurdufan, Sharq al Istiwa'iyah, Sinnar, Warab.

[45] Zakat is 10 per cent taxation for welfare. It is based on one of the eight obligations of Islam and asks for sharing of wealth with the poor.

[46] With the death of John Garang in a helicopter crash in August 2005 Salva Kiir took over his office.

However, conflicts do not rest in Sudan. There is an armed conflict between the central government, rebels, and different tribal groups in Darfur. The reasons are various - neglect of the area, scarce resources and tribal conflicts cause the expulsion and killing of the residents from the villages and local areas with unforeseeable consequences for the region and the whole country. Furthermore, there are reports about rebellions in the north and east of the country, so that peace in the whole country seems very unlikely in the near future.

5.4 Macroeconomic Situation

In the last few years an improvement can be recognised in the Sudanese economy. Still, Sudan is a heavily indebted poor country (HIPC) that has struggled with a high and rising external debt since the late 1970s (FAO 2004, World Bank 2006a). Along with huge fiscal deficits, debts, inflation, and the civil war in the South the Sudanese economy hardly developed. In the period from the 1960s to the early 1990s the majority of industries and enterprises were nationalised and controlled by interventionist policies, credit, and exchange restrictions. With the reforms in the mid-1990s the economic situation improved. The reforms contained the increase and support of the private sector and reduction of price and market controls[47]. The inflation dropped from 130 per cent in 1996 to about 8 per cent in 2002. From 1990 to 1995 the GDP grew on average by 3.8 per cent and from 1996 to 2000 on average by 6.6 per cent. The GDP for 2005 is estimated at US$23.2 billion with a growth rate of about 8 per cent. The average annual income per caput was about US$640 in 2005. Despite this the economic progress Sudan still faces developmental obstacles, including a poor infrastructure and an external debts (EIA 2004, FAO 2004, UNICEF 2004, World Bank 2006a, World Bank 2006b).

Agriculture is the most important sector in the Sudanese economy. Important crops are Sorghum (*Sorghum vulgare* or *bicolor*), millet (*Pennisetum glaucum* or *typhoides*), wheat (*Triticum aestivum*), gum arabic (*Acacia senegal*), sesame (*Sesamum indicum*), groundnuts (*Arachis hypogaea*), and cotton (*Gossypium hirsutum*). Other important industries are crude oil production and refining, sugar industry, cotton ginning, textiles, cement, edible oils, and gum arabic (CIA 2005, FAO 2004). Within the last five years the oil production has increased rapidly. In 2004 it was estimated at 345.000 barrels/day (CIA 2005, EIA 2004).

Livestock (especially sheep), sesame, groundnut, gum arabic, and cotton are the most important export products. Until the late 1990s agricultural exports counted more than 90 per cent of the total exports. This share declined sharply with the crude oil export since 1999 with a

[47] "The structural reform agenda was implemented within the framework of the Comprehensive National Strategy (CNS) for the 1992-2002 period. It encouraged a more liberal economic environment by removing price subsidies and eliminating trade and non-trade barriers. It unified the foreign exchange regime with the elimination of the surrender requirement of export receipts. The CNS also promoted trade reforms by removing import and export restrictions, reducing custom tariffs and rationalising the tariff structure. The size of the public sector was also reduced by disposing, 72 of 107 state-owned enterprises at end of 2002. Budget deficit, on cash basis, was constrained under 1 percent of GDP during the 1998-2002 period on account of moderate increase of both current and development expenditures, and improved government revenues owing to favourable oil revenues. The exchange rate has been stabilised since 1999, following increased, largely oil-retailed, foreign exchange inflows." (AFDB 2003)

share of about 75 per cent of the total export (EIA 2004, FAO 2004). The major import commodities are wheat, foodstuffs, manufactured goods, refinery and transport equipment, and medicines. In 2000 the external trade balance had a surplus of US$440 million for the first time in more than 20 years. This figure fell back in the following years relating to the declining oil price (CIA 2005, EIA 2004, FAO 2004). The most important trade partners are China, the Arab countries and the European Union (CIA 2005).

5.5 Agricultural Production

Agriculture is the most important sector in Sudan's economy. About 80 per cent of the work force is employed in the agricultural sector or agro-related industries. The contribution of agriculture to the GDP is about 40 per cent (CIA 2005, FAO 1995-2006, FAO 2004, Mohamed 1999, World Bank 2006c).

Sudan is an agrarian country and local food production and livestock breeding play very important roles for the food supply situation of the country. With a fertile area of about 84 million hectares (FAO 2002b) and about 130 million heads of livestock including cattle, sheep, goats, and camels (FAOStat 2006) the national supply seems quite satisfying and favourable. The broad variety of climates provides many opportunities for the production of different crops and livestock.

Specific crops and animal production systems are characteristic for certain farming systems and agro-ecological zones (Table 2, Appendix 3/map 2 + 4). For example, in the desert zone agriculture is practiced under irrigation in the Nile Valley. The livestock keeping in the arid areas is limited to seasonal watercourses and mainly practiced in the nomadic tradition (FAO 2002b). In the semi-desert zone traditional rainfed farming with such crops as millet, sorghum, sesame, groundnut, watermelon (*Citrullus lanatus*), pumpkin (*Cucurbita sp*.), vegetables (e.g. okra, tomatoes), and roselle (*Hibiscus sabdariffa*) is practiced. In the irrigation schemes in the Nile Valley and utilising seasonal rivers in Kassala and Red Sea state cotton, wheat, sorghum, sugar cane, groundnuts, vegetables, fodder crops, and fruit trees (e.g. banana, mango, guava) are grown. Pastoralism follows in the semi-desert zone seasonal wet and dry grazing lands (FAO 2002b).

In the low-rainfall savannah all kinds of agricultural farming systems are found. In traditional rainfed agriculture sorghum, roselle, vegetables, and sesame are grown on clay soils. Millet, sorghum, groundnut, sesame, roselle, and vegetables are grown on sandy soils. In this zone the gum arabic belt can be found with the major production of gum arabic from Acacia senegal (*hashab*) which is grown in intercropping with the named crops. Mechanised rainfed farming is mainly practiced in the south of this zone on clay soils since sandy soils are not suitable for heavy machinery. The crops of the mechanised sector are sorghum, cotton, and sesame. For the irrigated sector several schemes reach into this zone including the sugar cane plantations of Kenana and Asalaya. Pastoralism is this zone follows seasonal grazing routes (FAO 2002b).

In the high-rainfall savannah traditional rainfed and mechanised farming as well as pastoralism is typical. Even if sorghum and millet are the most important crops, maize as well as roots

like cassava and sweet potatoes are grown. Furthermore, forestry is important in that zone (FAO 2002b).

Since the South was heavily affected by the civil war the area could not be cultivated efficiently. Nevertheless, the typical way of agriculture in this area is transhumant pastoralism combined with traditional farming, fishing, and hunting. The main crops in that area are maize, sorghum, legumes, roots, and rice (FAO 2002b).

The last zone that should be mentioned is the mountain area of Jebel Marra. Because of the altitude of about 1500 m the climate is ideal for traditional horticultural production with vegetables, tree fruit (bananas, mango, citrus), and field crops as sorghum (FAO 2002b). At the present this region also suffers from violent conflicts and the production is very much endangered.

The agricultural season is from April/ May until August/ September in the South and from June/ July until October/ November in the North depending on the rainy season. Because of the progressively longer rainy season in the South two crops and two harvests might be possible in one season. For sorghum and millet the season is during summer while wheat is a winter crop grown in the time between November and March/ April (FAO 2002b).

6 Historical Development of the Sudanese Food Culture

6.1 The Development of the Sudanese Agriculture

The beginning of agriculture in Sudan is estimated at about 6,000 to 5,000 BC. There is archaeological evidence from about 4,000 BC that shows a variety of agricultural activities such as the domestication of cattle, sheep, and goats as well as fishing, hunting, and the harvesting of some rainfed wild grains. From about 3,000 BC with the movement of groups from West Africa to the east new tilling and cultivation techniques arrived in the area of today's Kordofan (Trilsbach 1991). The Egyptian influence (since about 2,800 BC) on agriculture was not very big. The main change of these times is the spreading of pastoral practices in the vast grasslands west of the Nile. The greatest innovation from Egypt was the introduction of the *shaduf* (a hand operated water-lifting device using a counterweighted bucket) for artificial irrigation (Trilsbach 1991).

The Meroitic dynasty (850 BC to 350 AD) played an important role in the development of the Sudanese agriculture and food culture. It is supposed that at these ages the climate in Nubia was more temperate and humid which indicates more dense vegetation than today. The shift of the capital from Napata to Meroë might have been caused to some extent by the restrictions of agriculture in the Napata area (Trilsbach 1991). Before the shift around 400 BC the Napata area suffered from a number of droughts and the agriculture was very dependent on the irrigation from the Nile. By contrast the area around Meroë had vast areas of rainfed grassland. With the shift agriculture was no longer restricted to the Nile. Sorghum was established to become the main staple crop to feed the rural and urban population. Seasonal nomadic routes were established which, to some extent, are the same up to date. Furthermore, the first major agricultural revolution took place - the development of engineering skills and techniques en-

abled the construction of canals and irrigation networks providing water away from the bank of the Nile. The introduction of the ox-powered water wheel (*saqqiya*) allowed water to be transported over greater distances. Nonetheless, the Nile determined the agriculture. The annual high water (from July to October) flooded the banks of the river and supplied it with very fertile mud. The farmers cultivated the fields in November and had not much to do on the fields until the crop in April. Agriculture along the Nile was very successful and efficient and most of the farmers produced a surplus (Dirar 1993, Tannahill 1988).

The new technical skills and know-how such as irrigation and ploughing made it possible to increase the crop diversity and productivity of crops like sorghum, wheat, barley (*Hordeum vulgare*), lentils (*Lens culinaris*), cucumbers (*Cucumis sativus*), and melons to feed the urban population (Trilsbach 1991). Sorghum was the most important cereal in Meroë. Long before the Meriotic times cattle[48] was the most important livestock. Milk and dairy products were important foods in the human diet. It is quite likely that most of the milk was fermented since the fresh milk would spoil quickly in the warm climate. Another very important innovation was the introduction of cotton at about 400 BC. It was grown on big plantations and lead to a successful textile industry until about 100 AD when the yields began to decrease. Cotton was introduced again from Egypt in the nineteenth century (Trilsbach 1991). The kingdom of Meroë was famous for its green fields, meadows, and pasture. The people of this time are claimed to have reached old age because of sufficient and plentiful food. There is a myth about Meroë: at the outskirt of the town the 'table of sun' was placed. That tabled was filled by a civil servant with plenty of cooked meat every evening and everybody who passed by that table could eat from it (Dirar 1993). Recordings from the 10th century report about the cultivation of sorghum and barley in Nubia, millet in the West and wheat in some northern parts. Sesame, dates (*Phoenix dactylifera*), broad beans (*Vicia faba*), and cowpeas (*Vigna unguiculata*) were found all over Nubia. Milk, meat, and fish (from the Nile and Red Sea) were also part of the diet (Dirar 1993).

Until the invasion by the Egypt under Muhammad Ali in 1821 the Nubian agriculture hardly advanced. The major agricultural development was the consolidation of existing irrigation techniques and the increasing of pastoralist activities with the invasion of Arab tribes in the 13th century. Especially tribes in western Sudan established nomadic practices and livestock breeding (Trilsbach 1991). With the Egyptian invasion in 1821 the Sudanese agriculture changed mainly from subsistence farming into a commercial and market focused agriculture. It concentrated on the improvement of irrigation and utilisation of the rainlands in order to serve the growing industrialised world. Cotton was established and cultivated under irrigation. The Egyptians brought other new crops to Sudan such as coffee, rice, and several fruit like citrus fruit, bananas, and figs, as well as a variety of vegetables. Another important innovation was sugar cane. Its production established very fast in irrigated areas and is today one of the most important cash crops in Sudan (Trilsbach 1991).

[48] Cattle was domesticated around 6,100-5,800 BC in the region of modern Turkey (Wolfers 1999, Tannahill 1988).

With the Anglo-Egyptian Condominium significant changes in the Sudanese agriculture took place. In the Nile Valley the first large-scale irrigation system, the Gezira scheme (which is up to date the biggest complex irrigation scheme in the world) was established (Trilsbach 1991). By the construction of the dam in Sennar water could be distributed by gravity over more than a million feddans[49]. The dammed up water was pumped by diesel pumps to the fields. The pump irrigation became more and more dominating compared to the traditional saqqiya and shaduf. Even though the water supply improved in many areas of Sudan investments in the agriculture of the West (Kordofan and Darfur) and South were little or even not existing (Trilsbach 1991). The most important improvement for central and West Sudan was the building of the railway to El Obeid which made the marketing of rainfed crops, especially of gum arabic, more efficient. The main focus of the colonial time was large-scale farming and the production of cash crops for the export. High investment in mechanised and irrigated farming was concentrated on the Nile Valley while traditional rainfed farming was marginalised and neglected.

The agricultural development since the independence in 1956 was characterised by the expansion of the Gezira scheme and establishment of a number of other smaller pump irrigation schemes along the Blue and White Nile and its tributaries. Furthermore, the railway was extended to Nyala which made the transport of rainfed crops and livestock easier. The civil war caused more of a collapse of the agricultural system in the whole country than allowing a development. Besides this, very little was done for and invested in the agriculture of the south and west of the country and in the traditional rainfed subsector. Again major investments went to large-scale irrigation and industrial schemes to strengthen the national economy and the export production (Trilsbach 1991).

> "Now, more than ever, Sudan's agricultural profile is characterized by a gulf between the two Sudans, not the North and the South, as political scientists would argue, but between the irrigated, primarily cash-crop production areas and those where production is still largely subsistence-based." (Trilsbach 1991: 189)

6.2 Influences on the Sudanese Food Culture

The development of Sudanese food culture can be derived from the development of the Sudanese agriculture. As the previous chapters have shown, there have been many external and internal influences on the development of Sudan over hundreds of years.

According to Dirar (1993) the Sudanese food culture is characterised by many different cultural influences, still he points out that the main influences are from western African regions and the Middle East. Dirar describes two main waves of influences - one is the movement from West to East Africa, the other one from north to south along the Nile. There are several geographical barriers which prevented other movements of people, hence the spread of cultural features. The desert Sahara in the north, the Ethiopian Plateau in the east and the Sudd,

[49] 1 Feddan = 1.038 Acres = 0.42 Hectares

and the equatorial forest in the south built these barriers. Therefore, the only ways of free movement allowed by the geographical characteristics are these from the west and along the Nile (Dirar 1993).

The influences from West Africa have occurred for thousands of years. From 5,000 BC to 2,000 BC when the climate was wetter there was a movement from the west which for example has introduced the domestication of cattle and goats to central Nile area. In the ancient time the west-east movement could have been caused by drought periods. Later, after the Islam had been introduces to Africa; pilgrims took the so-called 'Sudan Road' from West Africa via Sudan to Mecca. After the establishment of the irrigation schemes and mechanised agriculture in the Nile Valley people came from the west of Sudan to work in the schemes or to find work in the developing towns. Furthermore, several big droughts and famines in the west of Sudan caused a mass movement from these areas to the Nile Valley. The movement from west to east was relatively spontaneous and unorganised. Quite a large number of mainly poor people came to the Nile Valley over the last few centuries. Therefore, the food habits they brought were mostly 'poor man's survival foods' (cf. Dirar 1993: 12). Even if this food is typical for western Sudan it was under big influences of western African food culture for many centuries. These products are characterised mainly by fermented food from local products (Dirar 1993).

The north – south movement started with the times of the Egyptian pharaohs (3,000 BC) and brought cultural influences from the Middle East, the Mediterranean, and Egypt. This movement brought different important political and religious influences to Sudan. Apart from the pharaohic culture, Greek and Roman influences followed by Christianity spread through Sudan along the north – east front. At the end of the 13th century Arab tribes entered Sudan from the north. Even if the Arabs came from the east across the Red Sea too, the main route was from the north (BpB 2001). The movement along the Nile was characterised by smaller numbers of individuals. Their coming to Sudan was not spontaneous and the people were to some extent better off and might have belonged to the elite of their regions. Government officials, teachers, army officers, students, tourists, and diplomats where the type of people mainly coming from the north, bringing their culture and food habits to Sudan. In modern times these people mostly were quite familiar with the European culture or were even travellers, adventurer, explorer, scientists, traders, or government officials from the European continent. Especially since the colonial times there has been a strong European influence on the Sudanese food habits[50]. Mainly in urban areas European food was and still is very common. Even if the number of people of the north-south movement was quite small, the influence on the food habits, especially on urban and wealthier citizens, was very powerful. The food was usually non-fermented and fresh products like vegetables, meat, and fruit. It was the food of people who did not need to fear any shortage (of food or money) or starvation and always had access to the desired food (Dirar 1993).

[50] Because of the newly invented conservation methods (canning, freezing) during the industrialisation the white elite in the colonies could import European products (Mennell et al. 1992, Tannahill 1988).

Furthermore, many ancient trade and travel routes from China, India to the Middle East, the Mediterranean region, or East and West Africa (e.g. Silk Route, Sabaaen Lane, Incense Lane, Sudan Road, spice trade from Asia to Egypt and Rome) through or close to Sudan and have affected the Sudanese culture. The exchange between the cultures was boosted by the growing trade, the industrial revolution, the expanding number of travellers and migrants, and especially after the independence with the increasing globalisation (Mennell et al. 1992, Tannahill 1988; Teuteberg 1972a).

Within Sudan itself there have been some significant movements during the last decades, too. One reason is the migration of people from the western regions to the irrigation schemes in the Nile Valley and its bigger tributaries. A similar motivation for migration is the labour migration from rural areas to urban centres like Khartoum and Omdurman. However, mass movements from the west to the east have mainly taken place because of droughts, desertification, and famines. Another big long-term movement is the displacement of million of people from the south to north because of the civil war. Moreover, civil war refugees from southern neighbour countries such as Eritrea and Ethiopia came to Sudan and have brought their own traditions and cultures (Dirar 1993).

Even if there have been many different influences on the Sudanese food culture over thousands of years, the ones from West Africa and the Middle East are the most important and dominant ones. The Sudanese cuisine is characterised by African, Arab, and Mediterranean products and dishes. Distinctive is fermented food which plays a major role in the Sudanese food culture for thousands of years. Very generalised it can be said that the food from the west-east front is more common in rural and low-income households, whereas the food from the north-south front is more typical for the urban, especially better off, households.

7 Present Food Supply Situation in Sudan

7.1 Ecological Aspects and Influences on the Sudanese Food Supply Situation

Plants growing and animals living in a region are adapted to and characterised by the natural environment. The same way the climate and geography determine the agriculture and food production of a region. Most of the food production in Sudan takes place in the rainfed subsectors and the national food supply strongly dependents on the agricultural performance of the mechanised and traditional rainfed production (FAO 1995-2006).

The rainfall is one of the major limiting factors of the non-irrigated agriculture, where the main bulk of Sudanese food supply is produced (FAO 1995-2006). Especially in the semi-arid region the rainfall can decide whether the crop is successful or a failure. In these areas a decreasing cereal yield can be recognised since the present dry period which started in late 1960s as part of a climatic change towards drier conditions (Ahlcrona 1988, Walsh 1991). Apart from the amount of annual rainfall the crop yield depends on the timing (distribution) and strength of the rainfall according to the state of development of a plant and species (Ahlcrona 1988). Sometimes the rainy season has an early start and than stops for several weeks

which can effect the crops very badly. The rain also plays an important role in livestock husbandry. Sufficient rain guarantees pasture and fodder as well as water for the animals.

In case of sufficient rain not only the crop grows well but weeds grow better too, which affects the crop and yield. The weeding is usually done by hand, takes a lot of effort, and is very labour- and money-intensive. The cost for weeding can be so high that the whole production might become inefficient[51] but if the field is not weeded properly the whole crop can fail.

However, not only the rainfall is a limiting factor. The evaporation[52], crop and soil characteristics, weeds, pests, and diseases are also ecological factor which affect the crop, yield, and food supply (Ahlcrona 1988) because the food production happens with a limited use of agricultural inputs such as fertilizer, herbicides, and pesticides.

The storage of food is also affected by the natural environment. If food products are not stored in a proper way, the climate or pests can spoil or destroy it. Loss of nutrition, fungus, germs, unwanted germination, pest damage, and other qualitative and quantitative damages can occur depending on the environmental conditions.

To deal in the natural environment it is necessary to gain and adapt knowledge about the ecological circumstances and resources. Over generations the Sudanese have increased and developed their knowledge which provides food in normal times and crises. The people in subsistence farming in Sudan grow plants and breed livestock which are adapted to the natural environment. However, not only the agricultural production is adapted to the environment, even practices in food preparation are influenced by the ecology. Certain methods to store and process food such as fermentation or sun-drying have been developed due to ecological influences.

7.2 Land Tenure

Traditionally, land in Sudan was under the control of the tribes. The tribe as a unit of social organisation was responsible for the utilisation of the land within its boundaries. In some parts of Sudan tribes still control the land and the rights for cultivation and grazing. Under the Brit-

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[51] In Kordofan the cost for hand weeding of one acre of millet is SP40,000. The total production from one acre is about one sack of millet. Without weeding there will be no harnest at all. The return for one sack of millet is about SP50,000. So, weeding takes 80 per cent of the return. Additionally, there are expenses for harvesting, willowing, and threshening.

Hesse (cf. 2002: 179-181) writes that millet is non profitable even in good rain years and economically unattractive. His example of a millet farmer in Nuba Mountains showed following outcome: the farmer cultivated about 6 hectares of millet. The first and second weeding cost him SP60,000, the harvest SP10,000, the threshing SP12,000, and clearing of the field SP6,000 = total of SP88,000 (this is just the price for paid labour, family labour is not calculated). The crop was about 16 sacks. After the harvest season the market price per sack went down to SP4,500. In that case the farmer could have had bought 16 sacks for SP72,000.

This situation applies when the weeding is done by a paid worker. Traditionally the weeding was done by the farmer but mainly farmer's wife without monetary expenses. As soon as the weeding becomes a monetary business it would be interesting to look closer at the division of labour and by whom it is done.

[52] The evaporation is closely connected to the temperature, solar radiation, humidity, type of plants, vegetation and soil type.

ish-Egyptian ruling several ordinances were enacted which gave the government the power to acquire land for irrigation schemes. For example, with the Gezira Land Ordinance of the 1921 land owners agreed to rent or sell the land to the government to the price of non-irrigated land (Simpson 1991). This ordinance also regulated that the land could only be sold to the government which led to the situation that in the end most of the land had become government land. The former landowners were given the first right of tenancy which was inheritable. In 1950 the government claimed ownership for land suitable for the development of mechanised rainfed farming. The land of these areas had been used for nomadic grazing for many centuries maybe with sporadic cultivation and was unregistered. The areas were claimed by the government and leased out as holdings of about 1,000 feddans (Simpson 1991). All land was considered as property of the government as long as it was not claimed and registered. Land could not be registered as possession unless land ownership was proved (Simpson 1991). This led to the situation that a lot of the agricultural land remained unregistered even if rights of ownership existed but were not accepted by law. In 1970 the Unregistered Land Act was introduced. This legislation says that

> "Any land of any kind occupied or unoccupied which has not been registered before the commencement of the act shall be the property of the government and shall be deemed to have been registered as such." (Simpson 1991: 102)

With this act the government could allocate land even easier irrespective of entitlements to ownership.

As the land in the traditional rainfed areas is usually unregistered it has been claimed by the government since 1970. In areas with a low population density the people are free to use the land for cultivation (Simpson 1991). There are also still traditional structures of village leadership and tribes distributing the land to its members. In many cases the control over community land is traditionally organised in rainfed areas but without any acceptance by the governmental law. Non-cultivated land of communal areas is accessible for everyone for grazing of livestock. These free grazing areas are very important for nomadic tribes which are still organised after traditional patterns. Nevertheless, there are also areas of traditional rainfed land which are registered and inheritable and saleable (Hashim 1995, Simpson 1991).

7.3 Food Production of Sudan

7.3.1 Agriculture by Subsector

The agriculture in Sudan can be divided into five sub-systems: traditional rainfed agriculture, mechanised agriculture, irrigated agriculture, pasture, and forest (Hussein 1992, Mohamed 1999). The area covered by the different farming systems can just be given by estimated numbers since reliable data is not available. Sudan has an area of about 84 million ha of arable land of which about 17 million ha are utilised (FAO 2002b). About 1.7 million ha are under irrigation. About 6 million ha of the rainfed area are cultivated by mechanised farming

and about 9 million ha by traditional farming. About 24 million ha of the Sudanese territory are use as rangelands. Forest and woodlands cover estimated 86 million ha (AFDB 2003, CIA 2005, FAO 2000c, 2002b, FAOStat 2006, Mohamed 1999).[53]

The irrigated schemes are under gravity or pump irrigation and are located along the Nile or its tributaries. A third type of irrigation is the traditional flood irrigation in some river deltas. The major irrigation schemes are exclusively under the ownership of the government. The most important schemes are the Gezira scheme (880,000 ha)[54], the White Nile pump scheme (190,000 ha), and the Blue Nile pump scheme (112,000 ha) in Central Sudan and the New Halfa scheme (150,000 ha) and the Rahad scheme (120,000 ha) in the east (FAO 2005a). The gravity irrigation schemes are operated in collaboration with tenants. The farm size lies between 15 and 40 feddans. Apart from the sugar schemes the irrigation schemes are organised in a three-way partnership. The government owns the land and is responsible for developing and providing the irrigation. The parastatal board is responsible to administer and manage the production. It provides production inputs, management and control services (determines crop rotation, provides extension, infrastructure), and puts cotton, wheat, and sugar on the market (Brandt et al. 1987). The tenants provide the labour force and take care of the cultivation. The production is organised in an 'Individual Account System': the tenants are charged fixed rates for land and water per area to cover the administration and maintenance costs. The tenants on the other hand are paid according to their amount of delivered production (Brandt et al. 1987, Mohamed 1999). Brandt et al. (1987: 38) name four reasons for this kind of production system of the large schemes: a) only a central management can efficiently control and guide the use of water b) soil fertility can only be maintained by following a strict rotation c) machines can only be efficiently used on large adjacent area, which can only be created by a joint rotation of all tenants d) a joint rotation facilitates the use of herbicides and pesticides, especially for cotton spraying from the air.

The main crops grown in the irrigation schemes are cotton, wheat, sorghum, and groundnut with the rotation of cotton – wheat - sorghum or groundnut fallow (Brandt et al. 1987). Cotton and wheat are considered as a strategic crop for earning foreign exchange or create an import substitution. All cultivation activities are controlled by field inspectors and the input and services are provided for these two crops. The tenants have to deliver their cotton and wheat harvest to the parastatal. By contrast the input for sorghum and groundnut has to be provided and the crop is marketed by the farmers themselves (Brandt et al. 1987).

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[53] These numbers only indicate the current potential land use. It is quiet common that the agricultural areas vary from season to season depending on the actual influencing factors of the season (e.g. rainfall, producer price, governmental interventions).

[54] The Gezira scheme is worldwide the biggest irrigation scheme. It is situated south of Khartoum in the Gezira Plain between the White and Blue Nile. The Gezira scheme was established in 1925 with the completion of the Sennar dam by the British rulers. Before the scheme the area was characterised by the traditional cultivation of sorghum in combination with herding of cattle and sheep. Since the establishment of the scheme the main crop grown is cotton in rotation with sorghum (Brandt et al. 1987).

Pump irrigated schemes can be public or private schemes. The organisation is similar to the model of gravity schemes but the parastatal usually just provides the water and the tenants can decide themselves what to grow. The private irrigation schemes are mainly found in the northern parts of Sudan along the Nile, where mainly wheat and vegetables are grown (Brandt et al. 1987).

The irrigation schemes play an important role in Sudanese food and cash crop production as they are independent from rain. Especially the gravity irrigation schemes have the advantages of low cost irrigation, a secure supply of irrigation water, high quality soils, sufficient linkage to central infrastructure, and a large potential for the intensification of the production (Brandt et al. 1987). The growing potential is very high and the irrigated areas are almost the only areas with stable and high yields. The production is mainly affected by economic, political factors, insufficient water management, and lack of inputs, fuel, and spare parts. Still, pests and weeds can also occur as a serious problem in this subsector.

Even if the yields in the irrigated subsector are higher compared to the rainfed subsectors, the main food production in Sudan happens in the mechanised and traditional rainfed subsectors (Table 3) while the irrigated subsector is seen as backbone for the Sudanese economy to earn foreign exchange (Hashim 1994).

Table 3: Sorghum Production (‘000 t) by Subsector (according to FAO 1995-2006)

	‘93/94	**‘94/95**	**‘95/96**	**‘96/97**	**‘97/98**	**‘98/99**	**‘99/00**	**‘00/01**	**‘01/02**	**‘02/03**
Traditional	319	888	542	960	925	1,345	1,022	893	1,065	1,846
Mechanised	1,473	1,935	1,379	2,388	1,477	2,890	746	837	1,004	2,601
Total rainfed	*1,792*	*2,823*	*1,921*	*3,348*	*2,402*	*4,235*	*1,768*	*1,730*	*2,069*	*4,447*
Irrigated	593	715	513	887	730	546	579	900	862	741
Total	**2,385**	**3,538**	**2,434**	**4,235**	**3,132**	**4,781**	**2,347**	**2,630**	**2,931**	**5,188**

The bulk of Sudan’s food crops are produced in the mechanised rainfed agriculture. Mechanised farming is mainly done on central clay soils. This subsector is the main national producer of sorghum and sesame with the major production centres Gedaref, Kosti, Sennar, White, Blue and Upper Nile and South Kordofan (Brandt et al. 1987). These centres of mechanised farming are Sudan’s surplus regions for sorghum. The success of the food production of this subsector is to a big extent the guarantee for Sudan’s national self-sufficiency in food crops.

The usual farm size in mechanised agriculture is about 1,000 to 1,500 feddans. The land, owned by the government, is leased to the farmers for a low annual charge on the basis of a 15-years leasehold (Brandt et al. 1987, Mohamed 1999). The main crops are sorghum and sesame. The characteristics for the mechanised large-scale farming are mechanised cultivation and seeding, manual weeding and semi-mechanised harvesting. It is not an intensive but an extensive agriculture which can be explained by the dependence on the rainfall. The mechanised agriculture is very cost-intensive because of the need for machinery, spare parts, fuel, and labour. The input of fertiliser is not very common because of lacking finance and availability of foreign exchange (Brandt et al. 1987, Mohamed 1999).

Even if the mechanised subsector produces the bulk of sorghum this subsector creates several problems. Because of the relatively low yield the farmers spread in area to secure a successful harvest. That leads to a crowding out of pastoralist and traditional farmers into marginal areas. The clearance of land to spread the area and the cultivation and use of machinery causes erosion and exhaustion of the soils. Often the farmers do not rotate crops because sesame is very labour-intensive. Therefore, they might grow sorghum for many years with the result of soil exhaustion, growing weed and pest problems, and declining yields (Brandt et al. 1987).

The traditional rainfed subsector mainly focuses on subsistence farming and employs the majority of the agricultural population. It is the subsector with the lowest productivity and the one that is most easily hit by drought, famine, losses of rangeland, and soil degradation. The yields depend highly on rainfall and other natural factors such as weeds, pests, and soil fertility. The major crops, depending on the region, are sorghum, millet, sesame, groundnuts, gum arabic, watermelon, and roselle. In addition livestock is raised. The farms are usually very small with less than 10 feddans and the farming is done with hand tools only. The cultivated area can vary considerably depending on the seasonal rain, market, and household situation. The land is operated privately and is either private or community land (Brandt et al. 1987, Mohamed 1999). The production can be characterised as low-input, low-cost, and labour-intensive. The cultivation is done by monocropping or mixed/ intercropping.

Even if the bulk of food crops is produced on mechanised large-scale farms and the yield are the highest in the irrigated subsector, the traditional production is often the most important resource of food for the rural population. Especially in remote or low income regions subsistence production is the only supply of food and income for the households.

7.3.2 Food Crop Production

Sorghum Production

Sorghum as the main food crop is the major crop of the mechanised subsector and is also grown in large amounts in the traditional and irrigated subsectors (Table 3). The main national production areas are the central clay plains (Appendix 4). In these areas about 30 to 50 per cent of the country's sorghum is produced (FAO 1995-2006, Hashim 1994). The mechanised areas around Gedaref produce the main sorghum surplus supplying demand regions such as Khartoum (FAO 1995-2006, Hashim 1994). While the sorghum in the mechanised subsector is grown because of commercial motivations, the sorghum in the traditional subsector (about 30 per cent of the sorghum production) and in the irrigated subsector (about 20 per cent of the sorghum production) is mainly grown for subsistence and only partly for the market. The sorghum yields in the different subsectors vary significantly. In the traditional subsector the yield lies between 300 and 500 kg/ha, in the mechanised subsector it can be 300 to 1,000 kg/ha, and in the irrigated agriculture the yield is almost constant at about 2,000 kg/ha (FAO 1995-2006).

Even if there is a continuous long-term increase of the sorghum production, the amount of produced sorghum, the production area, as well as the yields sharply fluctuate from season to season (Table 4). This is because of unpredictable rains and influences of market mechanisms (FAO 1995-2006). After seasons of a good sorghum harvest the sorghum price usually de-

clines sharply which leads to a reduction of sorghum production in the following season. The other way around it can be observed that a season with a low sorghum harvest and with a rising price leads to an increase of sorghum production (area wise) in the following season.

Excursion: Fluctuation of the Sorghum Production and Prices

The fluctuations can be shown on the Sudanese sorghum production between 1995 and 2005 (Table 4). The season of 1994/95 had a satisfying sorghum harvest (3.6 million t) because of good rains and large production areas (6.4 million ha). This led to a drop of the sorghum price. For the next season the farmers reduced the area of sorghum and switched to more profitable cash crops like sesame and groundnuts. Another reason why the area was reduced was because of the unsatisfying rains at the beginning of the season 1995/96. Furthermore, there were pest problems and flooding which destroyed some of the crop. These led to a sharp rise of the sorghum price already during 1995. Thus, in 1996/97 the area for sorghum production increased, accompanied by good rainfall the sorghum crop was a success. For the season 1997/98 the production area of sorghum declined again. Because of very poor rains and a drought in September 1997 it came to a heavy slump in the sorghum production. In 1998/99 the area of sorghum production increased once more. Even though the good rains of this season favoured weeds to grow, the sorghum crop was very good causing a heavy drop in sorghum prices after the harvest. This led to a decline of the production area in 1999/2000. With only 4.5 million hectares this was the season with the second smallest area since 1990. While the sorghum area in the traditional subsector increased slightly (98/99: 1,998,000 ha; 99/00: 2,111,000 ha) the sorghum area in the mechanised subsector decreased (98/99: 3,983,600 ha; 99/00: 2,062,000 ha) because large-scale farmers switched to more lucrative cash crops, especially sesame (FAO 1995-2006). This is quite a normal occurrence as the mechanised subsector produces for the market focusing on maximum profits. Even though the season had very good rains the national production was, because of the reduced production area, the lowest (2.3 million t) since the drought of 1990. 2000/01 Sudan suffered first a drought in North and South, and then was hit by heavy rains and flooding. The production area decreased to 4.2 million hectares and the harvest was very low for the second year in a row. This caused an even higher sorghum price. After two bad harvests the production area of sorghum increased to over 5 million hectares in 2001/02 and because of good rains the harvest was successful. In 2002/03 again the area dropped a little because of the low price. In addition, erratic rains with dry spells caused a low sorghum production. The increased sorghum price and the tense sorghum supply over the last few seasons led to a sharp rise of the sorghum area in 2003/04 to over 7 million hectares which was up to then the biggest area of planted sorghum ever in the recorded history of Sudan. Accompanied by very good rainfall Sudan faced a bumper sorghum crop in 2003/04 of more than 5 million tonnes which also was the highest production result ever recorded. The bumper crop led to a heavy price drop of sorghum and a declining production area in 2004/05. Again erratic rains and pest problems caused a very poor harvest in that season (FAO 1995-2005, FAO 1995-2006).

The reviewed fluctuation of sorghum production between 1995 and 2005 is significant for Sudan. Especially the economically motivated reduction and rise of the production area in the mechanised subsector and erratic rains cause these ups and downs of the sorghum production.

Table 4: Cereal Production (‘000 t) and Area 1990 - 2006[55] (according to FAOStat 2006)

	Sorghum		**Millet**		**Wheat**	
Season	Production (‘000 t)	Area (‘000 ha)	Production (‘000 t)	Area (‘000 ha)	Production (‘000 t)	Area (‘000 ha)
1990/91	1,180	2,759	85	662	409	258
1991/92	3,581	5,100	308	1,118	686	463
1992/93	4,042	6,200	449	1,558	838	379
1993/94	2,386	4,684	221	1,069	453	329
1994/95	3,648	6,427	973	3,237	475	357
1995/96	2,450	5,045	385	2,418	448	278
1996/97	4,179	6,553	440	1,633	527	298
1997/98	2,870	5,329	643	2,809	642	329
1998/99	4,284	6,314	670	2,762	585	255
1999/00	2,347	4,530	499	2,394	172	142
2000/01	2,488	4,195	496	2,087	214	92
2001/02	4,394	5,742	578	2,586	303	120
2002/03	2,825	5,003	581	2,437	247	116
2003/04	5,188	7,081	784	2,570	332	150
2004/05	2,600	6,000	500	2,850	467	170

Millet Production

Another staple crop in Sudan is millet. In production patterns it is the second most important cereal after sorghum. Over 90 per cent of the millet production takes place in the traditional subsector and only small amounts are grown in mechanised agriculture (FAO 1995-2006, Hashim 1994). This can be explained by the fact that the traditionally millet is only common in the west of Sudan as well as the production is very labour-intensive with a relatively low output. The crop needs a lot of care during cultivation to produce any output at all. Therefore, from an economic point of view millet production is very inefficient.

The main production areas of millet are Darfur and Kordofan (Appendix 4). The yields of millet are relatively low (200 to 300 kg/ha) and the crop depends very much on the seasonal rain, the soil conditions, pests, and weeds. The millet areas have sandy soils with a low fertil-

[55] For the complete data of the Sudanese cereal production from 1961 until 2005 see Appendix 5.

ity and high vulnerability towards erosion and exhaustion. The loss of soil fertility is a reason for the continuously increase of the production area to compensate the demand. The millet production does not show as strong fluctuations (Table 4) as sorghum because millet is grown for the private demand and not for economic (FAO 1995-2006).

Most significant is the poor millet harvest in 1990/91 (Table 4) because of the drought. The traditional millet farmers cultivated only a very small area of 662,000 hectares with an output of only 85,000 t. By contrast in 1994/96 the rains were very favourable for millet production. Therefore, the area was increased to a recorded top of 3.2 million hectares which led to the highest ever-recorded millet crop of 973,000 t (FAO 1995-2006). Since millet is mainly grown for self-sufficiency the farmers react very much to the seasonal rain. Thus, it can be said that there are two obvious trends in the millet production: one is the increase or reduction of the area as reaction to rain conditions; the other one is the permanent increase of the area because of the declining soil fertility to cover the household's demand.

Wheat Production

Another important cereal in Sudan is wheat. The production is very low compared to the national demand. Wheat is traditionally grown under irrigation in North Sudan where up to date about 40 to 50 per cent of the national production takes place (Appendix 4). The Gezira scheme is the other main producing area for wheat. Almost all wheat (99 per cent) is grown under irrigation (FAO 1995-2006, Hashim 1994, Mohamed 2001). Even if the yields of wheat (1,000 to 2,000 kg/ha)[56] are much higher than the ones of sorghum or millet, the cost of production does not stand in any relation to the revenue. The wheat production is very capital-intensive because it needs many inputs like irrigation, fertilizer, pesticides, and machinery. Since wheat is indigenous only to some northern parts of Sudan its cultivation in the irrigation schemes has strategic reasons. The wheat production has been supported by the government for many years to reduce the wheat imports even though the subsidies create much higher cost per unit wheat than the cost for imports. The fluctuations of the wheat production and area (Table 4) are much more dependent on political decisions and economic factors than on natural influences. Even if the wheat sector is highly controlled and regulated the most serious constraints on the wheat production are the poor seeding methods, inadequate land preparation, lack of inputs, and bad water management (Mohamed 2001). During the 1990s the wheat production was heavily subsidised and the marketing was controlled by the government (FAO 1995-2006, Mohamed 2001). In 1997 the wheat market was liberalised and the support programmes for seeds and fertilizer were cut back. This made wheat unattractive for the tenants in the irrigation schemes and caused the heavy break in wheat production (Table 4). At the present the production depends on the world market mechanisms and the availability and access of credit and production factors. It is not profitable to produce big amounts of wheat when the world market price is low because the production cost in Sudan is quite high. In that

[56] The high yields are also a result of the cultivation under irrigation.

case it is cheaper to import wheat and the tenants shift to more lucrative cash crops like oil seeds or vegetables (FAO 1995-2005, FAO 1995-2006, Mohamed 2001).

The national wheat production covers about 25 per cent of the national wheat demand. Hence, wheat and wheat flour make up the bulk of cereal imports. The wheat imports have increased fivefold over the last ten years to up to more than one million tonnes per year (Appendix 6). This is not only because of the growing population and increasing food aid but also because of an increasing migration into urban centres and transition from agricultural to non-agricultural occupation linked with a growing demand for wheat products such as bread.

7.3.3 Storage Facilities

There are different kinds of traditional and modern storage facilities for grains in Sudan. Underground grain pits (*matmura*) are traditional storage facilities used in the central and eastern areas. The pit, which is dug into the ground, can be of different shape and size (1 to 100 t). The underground pits are low in costs and offer a constant temperature and moisture (Brandt et al. 1987, Hashim 1994, Hassan 1993, Ismail 1996). Other traditional storage facilities are platforms (*shonah*). This type is used right after harvest and before the rainy season. The platforms are open air and the grain is stored in sacks (Hashim 1994, Ismail 1996). Bins (*suweba*) are another traditional but also modern storage facility. Traditionally, the bins were made of clay, animal dung, and grass. The modern ones are of metal or fibreglass. They are used by households with traditional agriculture to keep the grains for their own consumption (Hashim 1994).

The major storage facilities in Sudan are warehouses. They can be traditional - made of local materials, or modern – made of bricks or concrete. They are mainly found in the eastern and central grain producing regions. The modern ones usually have a capacity of 1,000 to 14,000 t and the traditional ones of less than 350 t (Ismail 1996). Silos are the most modern storage facilities in Sudan. There are only two of them in the whole Sudan. One is in the main sorghum production area Gedaref (capacity of 100,000 t) and the other one in Port Sudan (50,000 t). This kind of storage is the most expensive and is under the ownership of the government (Hashim 1994, Ismail 1996).

7.3.4 Livestock

The livestock sector in Sudan is well developed. The number of animals and its export has been increasing continuously over the last decades (Appendix 5). Live animals, meat, hides, and skins are very important items for the country's export. The livestock is raised in different production systems: nomadic pastoralist, transhumant pastoralist, semi-sedentary and sedentary systems, integrated livestock/ crop production, commercial livestock breeding, and urban livestock raising (FAO 2002b, Mohamed 1999). In the traditional pastoral systems the animals are the only source of income and represent the wealth of their holders. The pastoralists are mainly semi-nomadic and move between dry and wet season grazing areas. The animals are only slaughtered for ceremonial occasions whereas milk is the most important part of the diet. The wool, hair, and skins of the animal are essential materials for housing, clothing, inte-

rior, and equipment. Apart of the material wealth the animals represent the social status and the self-esteem of their owners (Bennett 1948, Hashim 1995, Rahmann 1992). In agro-pastoralist systems the household relies on livestock and crop production. The grazing areas and movements depend on the kind and the importance of livestock and the cultivation patterns of the household (FAO 2002b, Hashim 1995). Furthermore, most farmers keep some kind of livestock for labour use or as an additional food or income source (FAO 2002b, Hashim 1995, Rahmann 1992). In urban areas the kept livestock (goats or sheep) can be understood as some kind of investment or 'savings account'.

Considering the increasing desertification and settlement, the growing number of livestock leads to ecological and social conflicts. The traditional nomadic areas are very vulnerable to over-grazing which is easily caused by an increasing number of livestock. In that case the destroyed areas cannot be used for any kind of agriculture or grazing for many years. Desertification and lack of sufficient watering places for the animals force pastoralists to move to other areas which easily causes tribal conflicts. Increasing settlement and spreading of crop production areas can obstruct traditional movement routes and lead to conflicts between farmers and pastoralists.

7.3.5 Food Industry

The food industry plays an important role in the Sudanese industrial sector. Over the last few decades many different factories were established. There are several vegetable oil mills, sugar refineries, flourmills, bakeries, dairies, butchers, and one big slaughterhouse, as well as pasta, biscuit, sweets, and beverage factories. The majority of the big factories were public owned since the 1980s but there are also many small private enterprises. Especially with the ongoing liberalisation and structural adjustment programme more and more factories go into private hands. Over the last few years many public food factories collapsed because of lacking competitiveness while new private enterprises developed. The majority of factories are found in central and eastern Sudan around the big towns and cities (Hashim 1994).

7.4 Socio-Economic Framework and Agricultural Markets

For many decades the economy of Sudan has been dominated by nationalisation and interventionist policies such as production, market, and price controls, as well as credit and exchange rate restrictions. Moreover, the economy has been influenced by the civil war, huge fiscal deficits, high inflation, and harsh living conditions (FAO 1995-2006). Through the economic reforms of the mid-1990s the economic situation started to improve. However, even with the reduction of state control and the growth of the private sector the socio- and macroeconomic situation of the country is still poor and fragile. The improvement of the economic situation can mainly be explained mainly by the significant oil exports. Nevertheless, the oil market is at least as sensible to the world market prices as the market of agricultural products and the export of mainly raw products leads to a high dependence of the export earnings on the world market price.

Even if the oil exports account for the main share of the exports since the year 2000, the agricultural sector is still the backbone of the Sudanese economy with about 80 per cent of the labour force working in agriculture and agro-industry (FAO 1995-2006). Disregarding the oil production agricultural products are the most important export commodities. Traditionally, cotton was the major export good. In the last few years gum arabic, groundnut, sesame, and livestock played an increasing role in the export. Excluding crude oil the agricultural exports accounted for over 95 per cent of the total export (FAO 1995-2006).

The infrastructure of Sudan is very weak. Transport facilities, communications, energy and water supply, educational, health, and administration services are insufficient in most parts of the country. The distances from the main production areas to the urban markets are very long. The major share of commodities is transported on the road. Up to date most of the roads are in a bad condition which makes transport a time and cost consuming enterprise. Moreover, the cost of fuel and the high foreign exchange cost for machinery and spare parts are the major constraints for road transport. Paved roads are mainly restricted to the central regions and its links to Port Sudan[57] (Brandt et al. 1987). Rail transportation is cheaper but even more unreliable since the railway is very old and the number of trains limited. An improved infrastructure would increase the possibilities for the rural producers, reduce the marketing cost, improve the producers' income, and reduce the cost for the consumers. Furthermore, it would lead to better access to education, health, and social services as well as it could improve the distribution of food products.

Agriculture and the trade of agricultural commodities is the most important sector of the Sudanese economy. Food crops for the national market such as sorghum, millet, wheat, and cash crops for the export such as sesame, groundnut, gum arabic, and cotton are produced in all the different agricultural subsectors. The marketing channels and actors are different from subsector to subsector and commodity to commodity. The markets of export and strategic commodities are intervened and controlled by the government through price policies, taxation, and parastatal monopolies, whereas markets serving the domestics needs are hardly influenced or mainly on the national level (Oesterdiekhoff 1991).

Even after all different kinds of policies and reforms the structures and hierarchies of the agricultural marketing established long before the independence still exist. For example, in the traditional agricultural production small peasants sell their crop to the village shopkeeper/ village trader (de Waal 1989, Oesterdiekhoff 1991). This usually happens under the conditions of an informal sheil contract. The peasant receives a credit from the shopkeeper/trader and the sheil contract determines the repayment in the form of crops by setting a fixed amount of a certain crop before harvest[58]. The rural shopkeepers (village traders) can be seen as cen-

[57] The road network is estimated on 11,900 km of which about 4,320 km are paved (CIA 2005).

[58] The peasants repay their credits by delivering the crop right after the harvest at a very low price. Normally, the contract already decides in advance how many sacks of the crop will be the repayment, no matter if the farmer will be able to harvest that amount. Moreover, the peasants' ability for decision-making on crop production is limited because they have to follow the sheil contract which determines the crop. That hardly gives them a chance for risk minimisation of crop damages and food shortage (cf. Oesterdiekhoff 1991: 369).

tral commercial institution of the rural areas, who sell consumer goods, buy the farmers' crops, and give credits. In the hierarchy of the agricultural marketing the village shopkeeper are followed by small (urban) traders or lorry owners who buy directly from the small farmers or from the rural shopkeeper. They might sell the locally demanded food products directly on local markets. If commodities are determined for larger crop markets, they are controlled by wholesale merchants. The small traders, usually assisted by agents, sell their goods to large traders/ wholesale merchants. This marketing stage is usually an oligopoly/ oligopsony (cf. Oesterdiekhoff 1991: 370) and is characterised by a high concentration of capital, storage, and transportation facilities.

In the irrigation schemes the tenants deliver their cotton and wheat crop at a fixed price to the parastatal board which puts these crops on the big market (Brandt et al. 1987, Hashim 1994, Oesterdiekhoff 1991). The crops are subject to a floor price which is set by the board. Sorghum, sesame, and groundnut are marketed privately by the tenants through similar market flows as in the traditional subsector (Hashim 1994).

In the mechanised subsector large-scale farmers often are traders, too. They sell their crops directly on the big central crop markets or to the Agricultural Bank of Sudan (ABS). In that case they must be able to meet all the production, storage, and transportation expenses themselves. The farmers are independent from any contracts and can make optimised arrangements concerning place and time of sale. In case they are not able to cover the expenses, they might have contracts with wholesale merchants who provide credits to cover production expenses and buy the crop at a discounted price. In case of formal bank credits (especially through the ABS) the crop is used to repay the credit and is marketed by the bank. This practice is limited to the storage capacities of the bank.

Sorghum as the main food crop, collected on the central crop market in the surplus regions (e.g. Gedaref) is distributed to the markets of demand regions by wholesalers. In times of and regions with severe food gaps sorghum is distributed by the ABS or national and international NGO's which buy grain from the central crop markets (Hashim 1994, Hassan 1993, Hussein 2001, Oesterdiekhoff 1991). In regions with a sorghum demand the export of sorghum is restricted or even prohibited. To export sorghum from one region to another within Sudan or abroad wholesalers need a licence – even in surplus areas. In times of a low national sorghum production the international export of sorghum is even prohibited.

The main institutions for the marketing of cash crops are auction markets which have been established in the urban centres of the production areas. They have the function to control the trade of the cash crops and to collect taxes and fees (Hassan 1993). Since the nationalisation in the 1970s the public monopolies such as the Gum Arabic Company, Sudan Cotton Company, or Sudan Oilseeds Company control and deal with the storage, marketing, and export of these products. Even if merchants collect the crops from producers they have to follow the

Nonetheless, sheil contracts are used by the peasants for several reasons. They can sell small quantities at any time depending on the household's financial needs and it provides them with cash quickly. Further, they save transport expenses and time to visit markets (cf. Oesterdiekhoff 1991: 368).

floor price set by the companies and the Ministry of Commerce (Adam 1996, Oesterdiekhoff 1991).

The marketing of oil seeds such as sesame and groundnuts is only partially regulated by public agencies. Sudan Oil Seeds Company who controlled the export operations was abolished in the late 1990s. The public monopoly used to buy the whole groundnut and sesame crop to a set price. Now, the national market of the oil seeds is almost completely left to private traders following the market mechanisms such as the sheil system (traditional, irrigated production) and large-scale farmers/ traders (mechanised production). The export market of oil seeds, however, is still controlled by the government through auction markets and floor price setting. But even if the oilseed market is controlled by the auction markets about half of the crop is offered on informal markets (Hashim 1994, Oesterdiekhoff 1991).

It becomes clear that especially small peasants and tenants depend on the sheil system. This is because of traditions but mainly because of lacking access to credits. The ABS who is the main provider for agricultural credits provides credits only farms bigger than 500 feddans (FAO 1995-2006). Small-scale agriculture characterised by the vulnerable environment, high risk of crop failure, and lack of collaterals hardly gets any formal and commercial credits. Instead agricultural credits mainly go to irrigated schemes and mechanised agriculture. Even though the availability of financing for agriculture rose in the last few years, programmes providing formal credits almost left out the support of small-scale agriculture. The lacking capital does not only impede the marketing possibilities of the peasants but it also detracts the production and leads to lacking inputs as fertiliser and seeds (FAO 1995-2006, Oesterdiekhoff 1991).

In general all marketing systems of Sudan are characterised by insufficient infrastructure with lacking transport, storage, and financing facilities. A small group of wholesalers and parastatal companies controls the market and is mainly interested to serve the urban and export market (Oesterdiekhoff 1991). The market flow can be seen as a vertical one-way road from the farmers to the wholesalers/ parastatal companies and the rural area to the urban centres and into export. This still has the characteristics of the colonial market system which skims off agriculture products to satisfy the urban population and elite.

7.5 Agricultural Policy Programmes and Agricultural Performance

Because of different national and international factors the economy of Sudan has been suffering a crisis since independence in 1956. Over-ambitious development programmes in the 1970s, failure of policy reforms in the 1980s, a worsening trade balance, increasing indebtedness, the overvaluation of the Sudanese currency, neglect of the traditional and low-productivity agriculture, an unstable national political situation, internal conflicts, and unfavourable world market trends led to a serious economic and political crisis Adapting several economic reforms to address these problems over the last few decades were not as successful as hoped for. The different political programmes focused at the improvement of the balance of payments and investment rate, a short-term economic growth, and political interests instead of aiming for example food self-sufficiency, regional food security, surplus production, in-

creased producers income, employment opportunities, improvement of natural resources, encouragement of private investment, or provision of infrastructure and service (cf. Wohlmuth 1991: 437).

Wohlmuth (1991) distinguishes the Sudanese agricultural policies into four periods: the colonial period, the post-independence period (1956 - 69), the 1970s including the 'bread basket' strategy, and the 'recovery and rehabilitation' in the 1980s. The time from 1989 up to date with the structural adjustment programmes of liberalisation and privatisation will be added as fifth period.

After the independence agricultural policies of the colonial period continued almost unchanged. Until that time the agricultural development and investment in agriculture concentrated on the irrigation subsector. With the 'Ten Year Plan of Economic and Social Development 1961/62 - 1970/71' (cf. Wohlmuth 1991: 438) the policies concentrated on the irrigation scheme and its expansion to increase and intensify the cash crop production and the agricultural exports. Furthermore, the food production in the mechanised subsector and its areas were expanded (Wohlmuth 1991). The traditional sector did not get any particular attention.

The 1970s are characterised by the nationalisation of the agricultural production, the agroindustry, and the industrial sector (Wohlmuth 1991). Policy for private investment especially in the irrigated subsector and export-oriented industries were subject to many governmental regulations and controls. This discouraged investment and initiatives by private entrepreneurs (Grawert 1998). The politics of the 1970s still neglected the traditional subsector and concentrated continuously on the mechanised and irrigated agriculture. With the 'Unregistered Land Act' of 1970 small-scale farmers were driven out of their traditional areas to the advantage of the mechanised agriculture. As a communist regime the Sudanese government at this time was inspired by the soviet ideology and concentrated on food import substitution to become self-sufficient and independent from the world market. With the 'Six Year Plan of Economic and Social Development 1977/8 - 1982/3' (cf. Wohlmuth 1991: 439) the Sudanese government gained awareness for the traditional subsector. Instead of a direct support and development of the traditional subsector the development strategies dealt with bringing labour from the low-income traditional agriculture to high-income areas by establishing new irrigated schemes. Another strategy was the increase of mechanised agriculture in the low-income areas to improve the farmers' income (Wohlmuth 1991). In the end the traditional subsector supported the modern agriculture by providing it with low-cost labour and traditional planting areas.

Another programme, which obstructed the improvement of the national agriculture and food security, was the 'bread basket' strategy. The idea of this programme was that Sudan could be the food supplier for the Arab countries. With its natural resource, western technologies, and Arab investment Sudan was planned to become the 'bread basket' for the Arab world (Gurdon 1991). By focusing on the rapid expansion of the irrigated and mainly mechanised subsectors a surplus should be produced - enough to export to and feed the other Arab countries. The policy was integrated in the 'Six Year Plan' as well as formulated in the 'Basic Programme for Agricultural Development in the Democratic Republic of Sudan 1976 - 1985' (cf. Wohl-

muth 1991: 441). It incorporated an over-ambitious annual growth rate of 6.5 per cent for agriculture, accompanied by a rapid horizontal expansion of agricultural land, instead of aiming to increase the productivity (Wohlmuth 1991). To implement these plans the Sudanese government depended on external finance. About 88 per cent of the planned investment was supposed to be for modern agriculture and livestock breeding. Another part of the investment was planned for agricultural services in the modern subsectors. Apart from not even considering ecological and social impacts of these strategies, the plan focused on reaching food self-sufficiency by supporting and expanding the large-scale mechanised farming instead of developing the peasant farming system. Only about 3 per cent of the total finance was planned for the traditional subsector and even that was used to introduce mechanised technologies in traditional rainfed areas (Wohlmuth 1991). In the end the 'bread basket' strategy failed because of the explosion of the oil price, the immense need of imported capital goods, the falling cotton exports, the growing foreign debts, the failure of the Arab investment, internal problems, and mismanagement (Grawert 1998, Gurdon 1991, Wohlmuth 1991).

The fourth period of policy programmes in the 1980s focused on recovery and rehabilitation. With a structural adjustment programme Sudan was supposed to correct the economic problems of the 1970s. On one hand the programme concentrated on the expansion of exports by reforming the production and price system and liberalising the trade. On the other hand the programme aimed at self-sufficiency (Mohamed 1999, Wohlmuth 1991). The major objectives of the programme were to adopt a more realistic exchange rate and to reduce export restrictions (cf. Wohlmuth 1991: 443). The policies supported existing projects to improve the production of export crops (cotton, oil seeds) and the production of import substitutes like wheat. Direct and export taxes on agricultural products were reduced and the monopolistic power of the public companies was abolished. Furthermore, the infrastructure of the major agricultural schemes was to be improved (Mohamed 1999). The funds of the investment programmes were for the irrigated agriculture exclusively (Wohlmuth 1991). In the scope of the adjustment policies 80 per cent of the World Bank's financial assistance went to the irrigated subsector, 18 per cent to the traditional, and 2 per cent to the mechanised (cf. Grawert 1998: 182). Furthermore, the government continuously promoted the export of agricultural raw materials which suppressed the diversification of the national production. Neglecting the traditional subsector which produces about 60 per cent of the staple crops and 30 per cent of the export crops (cf. Grawert 1998: 180) and pushing the export of sorghum for the benefit of the trade balance had an endangering effect on the national food security.

Despite of the strategies of the 1980s the Sudanese agriculture and economy stayed weak with an increasing national budget deficit. This was mainly because of the imbalance between the different agricultural subsectors as well as the lacking interaction between them and with the industrial sector due to biases and political interests. Therefore, the new government of 1989 undertook a wide range of economic reforms in the early 1990s which promised – on the paper – to be a change in the national development. The 'National Economic Salvation Program' of 1990 and the 'National Comprehensive Development Strategy' of 1992 (cf. Mohamed 1999: 7, Wohlmuth 1992) were adopted to underscore the position of agriculture as the backbone in the economic development. Once again the programmes targeted on achieving

self-sufficiency and on exporting agricultural products to generate foreign exchange. The goals were to be reached by the liberalisation of the economy, deregulation of price controls and the removal of administrative barriers as well as privatisation. That meant for the agricultural sector in particular the removal of subsidies on goods and services, reduction of food subsidies (wheat), the reduction of taxes, deregulation of price controls, removal of public marketing monopolies[59] (excluding gum arabic), and an increase of the credit ceiling for agriculture (Mohamed 1999). Furthermore, the position of the private sector and the privatisation of government-owned companies were supposed to be improved.

Even with the reform programme of the new regime the economy stayed weak and the government budget deficit increased. This was mainly due to weak and very vaguely formulated policy programmes and actions as well as the ongoing civil war in the South. The programmes were highly politicised with the main focus on the irrigated agriculture follow by the mechanised agriculture[60]. One of the major changes of the new policies was the expansion wheat production in the irrigated subsector. Cotton was heavily taxed and wheat production was subsidised. The expansion of the areas under wheat at the expense of cotton in the irrigated agriculture was economically inefficient in terms of crop patterns and meant a loss of foreign exchange (Mohamed 1999, Wohlmuth 1992). Wheat as a strategic crop was used for the self-sufficiency strategy to satisfy the urban population without any consideration of production cost and environmental effects. Concerning wheat all relevant production, distribution, and marketing issues were controlled by the government. Apart from the high investment in the irrigated agriculture the sorghum production in mechanised farming was supported. Once again the traditional agriculture was neglected (Grawert 1998, Wohlmuth 1992).

Until the late 1990s the government followed the policy of growing wheat and sorghum in the irrigation schemes at the cost of cotton to sustain self-sufficiency in food imports. In 1999 the wheat production and market was fully liberalised and all support programmes for the wheat production were abolished (e.g. free seed and fertilizer). Farmers in the irrigation schemes shifted to more lucrative cash crops since wheat, now following the rules of the international market, became unattractive (FAO 1995-2006). Even if the central government removed all taxes from agricultural goods by 2001, there are other indirect taxes (e.g. religious tax) on the agricultural production. Furthermore, governmental interventions continue especially in marketing of agricultural goods. These interventions are discouraging for agricultural especially food crop production and farmers shift to more profitable cash crops. The export tax for all crops has been lowered to 5 per cent except for cotton and gum arabic with 10 per cent[61] (cf.

[59] Governmental monopolies have a long tradition in the Sudan. After the Egyptian invasion in 1820 the new occupying power set up purchasing monopolies (e.g. gum arabic, tamarind). The products were collected from the producers at a fixed price. Only a few favoured merchants were given permission to trade their own accounts. Even if the government gave up the monopolies in 1849 due to international pressure, they introduced new regulations to secure the government's dominant position. Furthermore, the trade was impeded by governmental taxes on the products and toll stations on the trade routes.

[60] In their principles the government of al Bashir claimed to support the traditional agriculture and built up a credit system for small farmers. In reality the government never followed this course (Wohlmuth 1992).

[61] The marketing of gum arabic and cotton is still under strict governmental control.

Mohamed 1999: 13). There is still a clear bias towards the irrigated and mechanised agriculture by giving them easier access to credits and production inputs.

The present agricultural policies still follow the two main targets of improving the agricultural export and reaching self-sufficiency in import products. Even if there has been a slight improvement in the economic situation over the last few years[62], the agriculture of Sudan is still fragile and characterised by governmental control and intervention which hardly follows the farmers' interest. The high-cost irrigated subsector is an increasing burden for the national economy as long as it is under the control and influence of the government. The mechanised farming is turning into an increasing threat to the environment by overusage and degradation of the soil. Even so the mechanised and irrigated agriculture are a source of income for a big labour force in good crop years, it is not a stable source of income because of heavy fluctuations in the production. Both subsectors are a burden on the back of the traditional agriculture which actually is the guarantor for meal security of the rural population which makes up more than 60 per cent of the Sudanese residents.

7.6 Food Security and Self-Sufficiency

7.6.1 Global Perspective on Food Security and Its Concepts

The World Food Summit 1996 illustrated the disastrous worldwide food situation and motivated the MDG to reduce hunger and poverty by halving the proportion of the poor and hungry by the year 2015 (FAO 2004). Up to date more than 854 million people worldwide are undernourished with about 820 million living in developing countries (FAO 2006). The MDG seem far out of reach when realising that the total number of those affected increased within the last 10 years. Even if there are some regions in the world where the food situation has improved (like some parts of Asia or the Caribbean); in other regions the situation has worsen. Malnutrition and undernutrition in its various kinds not only affects the health and leads to infections and higher mortality in all stages of life; it also destroys socio-cultural and economic structures. An insufficient diet during childhood has an impact on the physical and mental development. Missing school because of illness or economic reasons can have severe influences on the lifetime skills, abilities and earnings. Malnourished adults are less productive which can strongly affect the economy (productivity, earnings, consumption) of whole nations. Malnutrition and famine destroy social networks not only by causing migration or displacement but also by the loss of social status through the loss of assets, property, and entitlements.

The definitions and concepts of food security are numerous. In the 1970s the political and development efforts mainly concentrated on the national and global food supply. Since the 1980s the approaches concentrate on the access to food on household level. The most widely spread and politically used definition for food security is

[62] To a large extent this is due to the oil export.

> "[…] the access by all people at all times to enough food for an active, healthy life. Its essential elements are the availability of food and the ability to acquire it. Food insecurity, in turn, is the lack of access to enough food. There are two kinds of insecurity: chronic and transitory. Chronic food insecurity is a continuously inadequate diet caused by the inability to acquire food. It affects households that persistently lack the ability either to buy enough food or to produce their own. Transitory food insecurity is a temporary decline in a household's access to enough food. It results from instability in food prices, food production, or household incomes – and, in its worst form, it produces famine." (World Bank 1986)[63]

This definition bases mainly on Sen's (1981) 'entitlement approach'. This general approach to starvation and famines focuses on the ability of people to acquire food. According to Sen the entitlements of a person are a "set of different alternative commodity bundles that the person can acquire through the use of the various legal64 channels of acquirement open to someone in his position" (Sen 1989:36). In private ownership market economies the set of entitlements depends on the 'endowment' (bundle of ownership) and 'exchange entitlement mapping' (set of alternative commodity bundles a person can acquire from each endowment) (cf. Sen 1981: 45-47). In case of a negative change in the endowments (e.g. loss of land, assets, labour power) or in the exchange entitlement mapping (e.g. rising prices, reducing wages or income, unemployment) the person may not be able to command enough food (Sen 1981, 1989). With the entitlement approach Sen shows that food security bases on the 'acquirement' (Sen 1989: 34) of food by households and individuals and not on food availability and food production. A sufficient overall food production or supply does not give any information how people acquire food as well as it does not automatically mean food security for vulnerable groups[65]. According to Sen food security is determined by the entitlements of the individual which are transformed through production, trade, labour, or inheritance and transferred into food or commodities which can be exchanged for food (Devereux 2000, Pottier 1999, Sen 1981). Starvation and famines are not necessarily a shortfall in food but also break down of the set of entitlements of individuals and certain groups.

Up to date the definition for food security and Sen's approach have been extended in several directions. However, it can be criticised that the definition as well as the 'entitlement approach' only give a limited and generalised point of view. Moreover, they exclusively focus

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[63] According to the World Food Summit 1996 "Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life."

[64] Sen himself sees the reduction to legal structures as a limitation of the approach as soon as illegal structures are of any importance. But he argues that most famines take "place in societies with 'law and order'" (Sen 1981. 49). I prefer the term 'unofficial' as this kind exchange might take place beyond official markets or even existing laws but cannot be judged as illegal. These unofficial structure maybe important and essential for the survival of many as official ways might restrict the entitlements of people. Unofficial structures are usually invisible or just being ignored because of being invisible; this does not mean they do not play an important role in many countries with instable food systems. Just the existence of laws and being invisible to economic analysis does not mean the absence of unofficial structures.

[65] Many leading international institutions and organisations base their analyses of food security on Sen's entitlement approach. Still, food security is in many cases measured by food production, supply, or nutritional intake per head, even though Sen clearly dissociates from that kind of measurement as adequate statement for food security.

on political, economic, and physiological influences without regarding socio-cultural structures. To deal with the problem of food insecurity the background of those affected and their ecological and socio-cultural environment has to be considered (Maxwell 1989, Pottier 1999). Furthermore, Maxwell (1989) argues that the general definition of food security is incomplete because "it subordinates the concept of 'security' to that of 'food consumption'" (cf. Maxwell 1991b: 2) and neglects the perception of those affected towards risk, plays down the problem of food security to a national level and does not amplify the differences between poverty and food security. Since malnutrition affects individuals it is also important to examine the intra-household distribution, as well as community activities in a socio-economic environment.

By focusing on the concept of 'livelihood security' Maxwell (1991) puts the issue of accessing food into a broader context which also involves people's concerns of non-food expenditure and preserving assets needed to maintain their future livelihood. The latter does not only focus on economic assets but also on preserving the ecological habitat and social relationships which are a most important asset and buffer in times of economic distress. Moreover, the food system of a country needs to be 'efficient' and 'equitable'.

> "A country and people are food secure when their food system operates in such a way to remove the fear that there will not be enough to eat. In particular, food security will be achieved when the poor and vulnerable, particularly women, children and those living in marginal areas, have secure access to the food they want. Food security will be achieved when equitable growth ensures that these groups have sustainable livelihoods: in the meantime and in addition, however, food security requires the efficient and equitable operation of the food system." (Maxwell 1988: 10)

The concept of livelihood security calls for the examination of the lifestyle and socio-cultural structures of a household and not only of food problems in the narrower sense of nutrition and economy. Thus intra-household resource allocations like access to resources, use of production factors in agriculture, agricultural activities, income distribution, education, health, and differences in food intake have to be looked at as well (Maxwell 1991).

Food and according to Maxwell livelihood security are prerequisites for the right to food[66]. Jean Ziegler, as Special Rapporteur of the Commission on Human Rights, defines the right to food as followed:

> "The right to food is the right to have regular, permanent and free access, either directly or by means of financial purchases, to quantitatively and qualitatively adequate and sufficient food corresponding to the cultural traditions of the people to which the consumer belongs, and which ensures a physical and mental, individual and collective, fulfilling and dignified life free of fear." (United Nations 2001)

Even if the concept of livelihood security a well as Ziegler's definition of the right to food include social and cultural characteristics they do not see food security and with it food habits as a complex matter and mainly focus on the access to food and food- and livelihood-related resources as well as physical satisfaction. However, nourishment is a complex procedure and

[66] The right to food is recognised in the 'Universal Declaration on Human Rights' (United Nations 1948) and the 'International Covenant on Economic, Social and Cultural Rights' (United Nations 1976)

apart from considering the impact of various natural and socio-cultural aspects it has to be kept in mind that food security can only be reached when a meal is consumed as the final act of food habits. This is a fact ignored by most of the leading concepts of food security. It is the consumption of a prepared and culturally bound meal that feeds the people. Food security might be reached by a secure access to wanted food and an equitable growth that ensures sustainable livelihoods. But meal security can only be achieved if people are also able to prepare that food into meals in a way their society and culture determines; if they are able to consume these meals in a way according to their socio-cultural framework; and if they not only satisfy their nutritional but their social and cultural needs, requirements, and desires.

7.6.2 Food Shortage in Sudan

Sudan, as many Sub-Saharan countries, has a long history of food shortage and famines. In agrarian cultures and subsistence farming transitory food shortage is a well-known challenge. Especially before the rainy season until the harvest food crisis are quite common. Over generations people have learned how to deal with these seasonal fluctuations by accommodating their diet and activities. These might not cover and satisfy their needs but secure their livelihood. For example, people avoid or reduce seasonal risk by diversification of the agricultural system, using special conservation and storage methods, by reducing the amount of food and number of meals, or changing their diet to wild food and by-products. They diversify their income by farm and non-farm activities and built up social networks with food sharing, gifts, or loan provision to bridge seasonal food gaps. However, traditional prevention and coping strategies do not make people immune to food shortage and famine as many cases in famine-prone regions show.

Until the early 1980s Sudan was a grain exporting country (Sukkary-Stolba 1993) and it exports sorghum up to date (Appendix 7). The exports do not automatically mean self-sufficiency in food supply. During the last two decades Sudan experienced several famines (1983 - 85, 1989 - 91, 1993, 1998). These were caused by droughts and furthered by the economic, political, and social circumstances. Famines are often described as unexpected food shortfalls. But famines are not just a temporary event. They do not occur suddenly and they have an impact on the future life even after the crisis. Usually famine is a result of several previous long-term influences and processes of environmental, demographical, social, economic, and political character (von Braun et al. 1998). Depending on the length and severity of the famine people might be affected in a long run even after the crisis due to a loss of entitlements and assets. This will be demonstrated through the description of two famines. These cases will make very clear the uniqueness of each famine and that each occurrence has to be regarded as a big accumulation of events. Famines are more than just hunger, malnutrition, and starvation. Often they include diseases, infertility, impoverishment, abandonment of previous ways of life, social breakdown, violence, and migration. For those affected the socio-economic factors, more than the natural ones, are often the actual reasons for famines. The cases will show that famines can be the result of the interaction of long-term drought, desertification and soil degradation, socio-economic crises, infrastructural deficiencies, instable food

markets, irresponsible agricultural and food policies, political calculation, and inadequate political and public responses (de Waal 1989, Teklu et al. 1991, von Braun et al. 1998).

Famine of 1983 - 85

The famine in 1983 - 85 was one of the most severe famines in Sudan within the last decades. The areas most affected were western Sudan especially Darfur and North Kordofan as well as the northeastern region in Red Sea Estate (Teklu et al. 1991). These regions are known as very vulnerable regions with very low rainfall and a high tendency of soil degradation and low yields. Even in good years many people cannot satisfy their food and livelihood demands.

In 1983 occurred a high crop failure and got worse in the following season[67] when the rain was very poor. This took place in a time which has been characterised by drought since 1965 (de Waal 1989, Teklu et al. 1991, von Braun et al. 1998). Since then the rainfall had continuously been declining, desertification had been moving onwards and the climate changed from savannah patterns to desert patterns. The effects of the drought were increased through long-term human activities such as overcultivating, overgrazing, and woodcutting which destroyed natural resources. The degradation led to a decrease in soil fertility of the already vulnerable sandy soils. Hence, the farmers had to increase the production area and ignored the crop rotation to cover their demand which furthered the soil degradation.

In the period of 1983 - 85 surface water was hardly available and often contaminated. Traditional water storage techniques like the use of the tabaldi tree and watermelons were marginalised by the introduction of water pumps and hafirs. The modern techniques needed a lot of maintenance and many pumps broke down in the hot weather and dust. Many boreholes ran dry even before 1983. For the people this meant longer travel for water and less time for other activities sustaining their livelihood. For herders this also meant longer travel to pasture land often into areas which were not their traditional pasture grounds. This not only increased the risk of conflicts by entering non-traditional areas but they also had to pay for the usage of pasture and water (de Waal 1989).

Even if the drought was the main cause for the famine, the instable economy and agricultural market also influenced the food supply situation heavily. The economic situation was marked by falling exports and imports as well a negative trade balance, heavy governmental interventions, price instability, ineffective marketing structures, corruption, high inflation, high foreign debts, and black market trade. During the famine of 1983 - 85 the prices of cereals rose fivefold and the terms of trade between grains and livestock and grain to cash crops declined drastically (cf. de Waal 1989: 119, von Braun et al. 1998: 72). Furthermore, high taxes for agricultural products, governmental interventions like licences for sorghum export into the deficiency regions, and high transportation expenses[68] increased the prices (de Waal 1989,

[67] For example, the millet production of that season was about 14 per cent of the normal average production.

[68] Not only the hardly working railway and bad and unpaved roads made transportation expensive or even impossible but the high price of fuel, lacking spare parts, and only a small number of trucks made transport very inefficient.

von Braun et al. 1998). Since the economy of West Sudan was isolated from the national economy it were the local market mechanisms which saved the region from worse as the local commercial farmers shifted from cash crops to, in that case, more lucrative cereals (de Waal 1989). Meanwhile the government failed to strengthen the weak food supply situation by interventions like food imports or transportation of cereals from surplus to deficiency areas[69].

People reacted in different ways to the famine according to their natural and social environment and potentials[70]. Many people coped with the famine by changing their diets, reducing the quantity of food consumed per meal, and decreasing the number of meals per day. Furthermore, they collected or bought food items which were usually not consumed (Teklu et al. 1991). For many tribes wild crops are a quite common diet even during 'normal' times, especially within the rainy season. But the collection of wild food is very labour-intensive and might keep that labour away from the farm or pastoral production and children away from school (Keen 1993). Another phenomenon, which was observed in some cases, was that adults were preferred with food and not children, weak or sick people. If the household want to survive, it may depend on the income earned during the crisis. Hence, the income-earning members depend on the food to sustain the livelihood of the household as a unit and not considering each individual member (Maxwell 1991b, c). Other households gave the available food to the children and women first because the men were physically stronger and could deal better with hunger (Keen 1993). Herders started to sell livestock not only to obtain money or exchange goods but also to lower the cost of maintaining the herd. In addition, many people changed their activities to handicrafts or services to generate an income. Moreover, social networks played an essential role. Better-off and less affected relatives or community members supported people who were hit harder by the famine. Not only traditional charity fund and zakat were given, local leaders often gave material/ monetary as well as mental support. However, the longer the famine lasted the more these social networks broke down because more and more people were affected by destitution and were not able to maintain the networks.

At an advanced stage of the famine many households chose to sell productive and non-productive assets to buy food instead. This strategy like the sale of livestock can have a serious effect on the present and future of the household; it can lead to destitution and higher the

[69] For many decades the central government has been concentrating on the modernisation of the agricultural sector and promoted large-scale and capital-intensive production in high potential areas and neglected small-scale and subsistence farming as well as traditional livestock breeders. In seasons of crop failure the lacking rural development since pre-colonial times, especially in isolated regions like the West, lead to severe food and income shortage of vulnerable groups. The government's irresponsible response is furthermore underlined by missing policies according to food security and famine and playing down the serious nature of the famine in 1983-85. Another factor increasing the crises in 1983-85 was the lacking credit system for small farmers to keep their production running by buying seeds or using the money to buy food or other products and services to sustain livelihood (de Waal 1989).

[70] It should be considered that survival strategies can be divided into those which jeopardise the future production and livelihood and those that do not. This can effect single households for example in case of loss of livestock, land, assets, health and education or effect a certain area for example through the damage of the environment or breakdown of social networks.

risk of vulnerability to future famines (Keen 1993). One of the very last strategies was to change to wood, charcoal, and pottery selling as well as water carrying. These activities meant the loss of social status, since these were activities of non-belongers, landless, and new migrants with no rights and assets (de Waal 1989).

Many rural households in Darfur and North Kordofan depend on paid farm work during the off-season. During the dry season people migrate to the southern regions, irrigation schemes, and mechanised farming areas where they find paid work. Also migration to urban centres to work in the service sector is quite common. Just before the rainy season people return to their homes to cultivate their fields. These activities are essential to obtain their livelihood and are practiced even in good crop years. In the seasons of 1983 - 85 many people migrated much earlier and in bigger numbers at the first sight of the failing crop and lacking water. This caused an over-supply of labourers on one hand, and on the other hand less labour was demanded because of the poor rains. Therefore, not only the wages fell but also many people could not find farm or off-farm work at all (de Waal 1989). Furthermore, many people migrated to urban centres or relief camps where at least food and water were available.

De Waal (1989) shows that for many people suffering from famine the satisfaction of nutritional needs was not so important but to sustain their livelihood for the future. "[R]ural people are not concerned so much to satisfy their physiological hunger as to avoid impoverishment" (cf. de Waal 1991: 69). In Sudan famine is much more seen as a crisis of society and livelihood than of hunger. Destitution and social breakdown is more feared than starvation. To preserve their base for the future people prefer not to eat their harvest but keep it for the next season as seeds. They also try not to sell their animals as long as possible because they are very important investments. People are willing to deal with hunger (de Waal 1989, Grawert 1998).

With the beginning rains in 1985 many migrants returned to their homes to cultivate their field but this did not mean that the famine-affected people stopped suffering from the famine anymore. Their nutritional status might have improved with a new harvest but many households suffered from the loss of assets for several years. Recovery from lost or destroyed property often takes years and affects the economic and social situation of the household. Pastoralists who mainly live from livestock breeding do not recover easily from devastating livestock losses. Subsistence farmers who depend on the natural environment do not recover easily from destroyed soils. These can affect the base of livelihood of whole communities and regions and can create long-term food insecurity.

The relief during the famine varied from region to region. There was local relief which depended on the local traditions and social networks (de Waal 1989). The national and international relief was very little and arrived too late. The central government played down the seriousness of the famine until 1984 and requested only little international help. The distribution of the food aid was highly controlled by the government. The food was mainly sold on urban markets. For one reason it was because of the government's interest to keep the urban population quiet and avoid uprisings. For another reason many needy regions were hardly to reach and the transport was almost impossible and very expensive (de Waal 1989, 1997).

Famine of 1989 - 91

From 1989 to 1991 another drought occurred which hit the west and east of Sudan hardest and even spread to the central regions. This famine was characterised by two failed crops in a row in 1989 and 1990. Those affected, hardly had time to recover from the previous drought in 1983.85 when they were hit again. Again, people tried to cope with the crisis to secure their livelihood by extending their activities and changing the dietary patterns. But when they realised that there was no paid labour and grain price rose to a six fold (Grawert 1998) they were forced to life from their monetary and non-monetary savings and started to destroy the basis of their livelihood by selling their assets (as far as any left since the last drought, land, jewellery).

Again, the government had denied the crisis and had claimed to be able to close the food gap without international aid. The new military government, in power since June 1989, used the slogan 'we eat what we grow' to gain independence from the western world and Arab countries without considering the seriousness of the food supply, economic, and social situation. Apart from the civil war in the South and the Nuba Mountains the economic and food supply situation worsen when the government declared its support for the Iraqi invention in Kuwait. This led many urban middle and upper class households to buy up all available food in the market and storing it in case of economic or even military consequences for the country. Between June and September 1990 it frequently occurred that no grain was available in the market at all. This resulted in more hunger for those who bought their grain on a day-to-day basis. The crisis was pushed since the government had exported almost the entire cereal stock of previous years to Europe and Saudi Arabia as animal feed (de Waal 1997). No resources available, the government was not able to manage the situation. It was, however, not willing to admit a famine right at the start of its assumption of power and ignored it. Their only effort was to send soldiers and security officials to the markets to control the grain sale. To avoid food riots in Khartoum the Security Council cut of the water supply of the shantytowns and forcibly moved ten thousands of migrants, who had came to the outbound of Khartoum, back to their home regions (de Waal 1997).

Emergency Relief

To overcome a famine it is not enough to rely on people's survival strategies as they do not remove the need for relief. Relying on the survival strategies only can even cause serious danger to the livelihood and environment. To overcome an emergency successfully it is much more important to bring the relief programmes in line with the existing survival strategies. In the case of Sudan it is very likely that the rate of destitution and mortality would have been much smaller in recent famines if relief would have had reached the people in need at the right place, at the right time, in the right form, and right amount (de Waal 1985, Keen 1993). Relief should be an instrument to stop people from using certain strategies which might cause more damage than having a positive effect. It also should not be seen as an instrument to feed people because food aid alone does not prevent people from destitution or death. Just supporting the food demand might discourage the affected from food production and agricultural and income generating activities. Supporting the production of a household would have given im-

portant encouragement to stay at their homeland and pursue their daily activities. Food relief can only be helpful if it reaches those affected at the right time and if the recipient is able do decide freely what to do with the share. It has to be seen as an income transfer and economic intervention, not a nutritional support because the households not only rely on food but also cash for non-food products and services (de Waal 1985, Keen 1993).

The distribution of free or cheap seeds would have been of great help for poor farmers. However, it could also cause problems. Firstly, it has to be distributed at the right time (before the rain starts) otherwise it might be consumed or sold. Secondly, in many regions farmers use their own special varieties which are adapted to the natural environment. These varieties may vary even from village to village and are rarely found anywhere else. A uniform seed might bring little success. Therefore, people often eat the seed or exchange it for locally produced seeds (de Waal 1985, Keen 1993).

Assisting the survival of livestock (fodder aid, veterinary service, free water) might have stopped herders from long exhausting travel which causes death of animals, raising expenses, and tribal conflicts. Guaranteeing prices for livestock would have given the owners a fair price, increased their cash income during the famine, and given them the opportunity to re-sell animals after the crisis to a similar price.

A guaranteed employment or income as well as the distribution of cash could have been another instrument of relief. During the crises affected people were much more in the need for cash then food. Cash would have allowed them to support their own survival strategies and give them the freedom to decide what to use it for. It could have prevented people from distress sales, allowed them to buy fodder, to travel to markets for trading, to buy seeds for the next season, or spend it on social obligations (de Waal 1985, 1991, Keen 1993).

The first rule for relief programmes should always be to look at the possible effects of outside interventions on the whole livelihood system and how the operation is compatible with the strategies of those affected at a certain time (de Waal 1989, 1997). It is necessary to understand famine as an event with different factors which not necessarily means that the people's biggest concern is to cover their nutritional demand but to avoid impoverishment. In many societies famine is much more seen as a crisis of society and livelihood than of hunger. Destitution and social breakdown is much more feared than starvation. Nevertheless the most efficient way of famine relief is prevention which requires sustainable planning and commitment and needs a broad variety of professional and political skills.

7.6.3 Present National Food Security in Sudan

Apart from being vulnerable and prone to transitory food insecurity wide parts of Sudan suffer from chronic malnutrition. Even if transitory food shortage usually hits a big number of already vulnerable people, endangers their livelihood, and can be life threatening, chronic food shortage is more likely to have long-term effects for the individual and the whole society. To overcome chronic food shortage the strategies used during transitory food shortage do not work. The shortage is not only a quantitative deficiency but also a qualitative one as certain nutrients are not sufficiently available over a longer period. Chronic food shortage leads

to long-term changes for those affected, not only in terms of nutrition or health but also social and economic situation. The people have to change their daily activities and lifestyle to survive and very often social structures break down as people migrate or social obligations and duties cannot be practiced due to lacking assets (den Hartog and van Staveren 1995).

Generally the average per capita grain supply in Sudan is about 150 kg per year (FAOStat 2006). The daily average per capita calorie intake is about 2,200 kcal[71] (FAO 2005b). About 60 per cent of the energy consumption are carbohydrates, 13 per cent protein, and 28 per cent fat[72] (FAO 2005b). About 53 per cent of the food products are cereals, 13 per cent dairy products, 8 per cent sugar, 7 per cent vegetable products and oil, 5 per cent meat, 4 per cent pulses, and 10 per cent are other products like starchy roots, fruit etc.[73] (FAO 2005b). These numbers just give a vague impression of the nationwide supply situation and dietary intake from a nutritional point of view. The data concerning the nutritional status and the national production are often roughly estimated numbers[74]. To look at the real food supply situation the given data are not reliable and say nothing about the food distribution, coverage of the nutritional demand or preferences of individuals. To discuss meal security and self-sufficiency it is important to examine the economic, political, and social situation as well as the entitlements, the access to resources, the food culture, and the perception and preferences of the individuals.

The food supply and production (especially sorghum) is very instable with heavy fluctuations. Sorghum as the main staple is mainly produced in the country and even in deficit years only small amounts are imported (1985: 414.000 t, 1991: 240.000 t) (FAOStat 2006). This does not mean that Sudan is self-sufficient in sorghum. Even if Sudan reaches self-sufficiency in good years a severe food gap exists in many regions and households. Especially rural people in the West (Kordofan, Darfur), the South, the East (Red Sea Estate), and the urban poor are very vulnerable and many suffer from chronic malnutrition. Even in surplus areas not everybody is safe from food insecurity. Many households are undernourished which shows that the food problem is not only caused by the food production but also by unequal access to an adequate livelihood and available food and resources.

The malnutrition rates increased drastically within the last few years to 15 to 30 per cent in many regions (FAO 1995-2006) with an alarming national average of 27 per cent in 2001 - 03 (FAO 1995-2006). In some regions in the South the rates were up to almost 40 per cent because of the civil war. In other regions in the West and East the rates were 25 to 30 per cent

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71 The daily average per capita calorie intake per day in industrialised countries is about 3,300-3,700 kcal (FAO 2005b)

72 Industrialised countries: about 51 per cent carbohydrates, 11 per cent protein, 37 per cent fat (FAO 2005b).

73 U.S.A.: about 22 per cent cereals, 10 per cent dairy products, 17 per cent sugar, 17 per cent vegetable products and oil, 12 per cent meat, 3 per cent fruit, 3 per cent animal products and fats, 3 per cent starchy roots, 4 per cent alcohol and 6 per cent others. Germany: about 24 per cent cereals, 8 per cent dairy products, 12 per cent sugar, 13 per cent vegetable products and oil, 10 per cent meat, 4 per cent fruit, 9 per cent animal products and fats, 4 per cent starchy roots, 7 per cent alcohol and 9 per cent others (FAO 2005b).

74 Officials might put numbers which fit their politics, unofficial markets and smuggling are usually ignored, local authorities might fake data to get more government support, producers might underestimate their production to avoid taxation, data might be passed on incorrectly because of lacking communication, and so on.

because of droughts. Since 2003 the national malnutrition rate has been decreasing slightly (FAO 1995-2005, FAO 1995-2006). Especially in the South the situation has improved due to the peace process. In the East the situation is still bad as well as the number of malnourished people in Darfur will increase because of the ongoing violent conflict.

Even if the climate has an impact on the food production of Sudan the previous chapters have shown that erratic rains and a fragile environment are just one aspect. The poor macro-economic performance, the instable and insufficient food system, the commercialisation of agriculture, the governmental policies, the rapid urbanisation, the growth of the labour force, and the violent conflicts, have a direct influence on the national food supply.

8 Food Processing and Conservation: Fermentation in Sudanese Food Culture

8.1 General Importance of Fermentation

Worldwide a big number of food processing and conversation methods do exist. While technologies like drying, pickling, and fermenting are practised on household level for thousands of years methods like bottling, canning, pasteurising, chilling, and deep-freezing are more common since the industrial revolution. Fermentation is one of the oldest conservation methods of the world. Fermented food like bread, dairy products, wine, and beer have been consumed all over the world for thousands of years and are very closely linked with culture and traditions (Campbell-Platt 1987, FAO 1998, 1999, 2000b). The knowledge about the preparation of fermented products has been passed on for generations and is an important part of the indigenous knowledge (FAO 1998, 2000b).

It is assumed that prehistoric societies (13,000 to 8,000 BC) already used fermenting technology. There are proved evidences for the fermentation of different product from Babylon (about 5,000 BC), Egypt (about 3,000 BC), Mexico (about 2,000 BC), Sudan (about 1,500 BC), and China (about 1,000 BC) (Campbell-Platt 1987, FAO 1998, 1999, 2000b).

The process of fermentation is a natural one. It is the slow decomposition of organic substances by microorganism and their enzymes. Carbohydrates and protein are broken down by an aerobic or anaerobic reaction (Campbell-Platt 1987, FAO 1998). Worldwide about one-third of the diet bases on fermented food. The number of fermented food is estimated at more than 3,500 (FAO 1999, 2000b). In many societies fermentation is very important for the diet. It is a reasonable process which increases the nutritional value and durability of the food and improves food safety and security (FAO 1999, 2000b). In Sudan fermentation plays a very important part in food processing and preparation. There are more than 80 different fermented products (cf. Dirar 1993: 20 ff.). Most of the staple food is consumed as fermented dishes. Especially meals made of grains are hardly eaten unfermented.

In industrial nations fermented products are mainly processed industrially. Those are not only food products but semi-luxuries, additives, vitamins, and medicine, too (0). The industrial fermentation process is often investigated in detail and technologies and equipments are highly developed. Nonetheless, in regional cultures all over the world fermented food products are prepared by hand on household level with simple technologies (FAO 1999, 2000b).

Table 5: Products Manufactured Using Industrial Fermentation Processes (FAO 2000b: 10)

Alcoholic beverages	Wines, beer
Milk and milk products	Cultured milks, yogurts, cheeses
Antibiotics	Penicillin, tetracyclins, streptomycin
Organic solvents	Acetone, butanol, ethanol
Gases	Carbon dioxide, hydrogen, methane
Flavours	Monosodium glutamate, nucleotides
Organic acids	Lactic acid, citric acid, acetic acid
Amino acids	Lysine, glutamic acid
Vitamins	Vitamins A, C and B 12, riboflavin
Hormones	Steroids, insulin
Enzymes	Amylases, proteases, invertases

8.2 Economic and Social Importance of Traditional Fermentation

Particular in warm and humid regions fresh food products spoil very easily. Through different conservation methods, as drying, freezing, canning, pickling, or fermenting food products can be preserved and their shelf life can be increased. In many regions of the development countries there are no opportunities to can or freeze foodstuff on household or small enterprise level because of lacking technology and finances. By contrast fermentation is a very efficient and reasonable method of conservation. The process needs very little technological effort and energy input and can be carried out on household level (FAO 1998, 1999, 2000b).

Especially in rural areas fermentation is very useful. The process itself is fast and does not need high labour input. Through the microbial change of the product the time of cooking decreases significantly. Some grain legumes for example take up to six hours to cook, by contrast fermented grain legumes only need minutes (FAO 1998, 1999, 2000b). In that case households can save fuel or firewood which often is a scarce resource.

Fermented food is an important part of many regional and national food cultures. The knowledge of traditional fermentation processes have usually been passed on from generation to generation – usually from mother to daughter. This knowledge has usually been accommodated to techniques as well as social and economic conditions over centuries and is an important part of the indigenous knowledge (FAO 1998, 2000b). In some cultures fermented food, dishes and drinks are appreciated as cultural heritage as kimchi in Korea, cheese in France and Switzerland, soy sauce in China, kefir in Russia, beer in several countries all over the world, wine in France, whisky in Scotland, or tea in Japan. Nevertheless, in many countries traditional fermented food has the image to be food of the poor. In African households for example it can be observed that with increasing income the consumption of fermented food decreases or even totally stops. This could be explained by the fact that the traditional food preparation is considered as unhygienic and primitive in the western world view as the basic material for fermentation is hardly cleaned to keep the natural existing microorganism for the fermentation process (FAO 1998, 1999, 2000b).

8.3 Nutritive Importance of Fermented Food

Through fermentation the flavour and texture change and the nutritional value of food increases. The typical sour flavour of fermented food makes the products not only tastier but is known to be appetising, thirst-quenching, and leads to a higher ingestion (Dirar 1993, FAO 1998, 1999, 2000b). Fermented products are of a smooth and elastic texture which makes them easier to process. Furthermore, the content and availability of protein, essential amino acids, fatty acids, vitamins, and mineral nutrients is higher than in the raw product. That is due to the activities of the microorganisms which decompose indigestible and heavy digestible food elements into digestible components. For example, the human digestive system is not able to digest cellulose. Through the activity of microorganisms in the fermentation process indigestible cellulose is decomposed into digestible sugar. Starch is decomposed into glucose, complex protein is decomposed into amino acids, and saturated fatty acids, into un- and polyunsaturated fatty acids (Dirar 1993, FAO 1998, 1999, 2000b).

Moreover, through fermentation the content of toxic or antinutritional substances decreases. Many raw plants (several cereals, legumes, cassava) contain substances which are indigestible, noxious, or even toxic for humans (e.g. toxic glucosides, phytates, tannins, saponins, enzyme inhibitors). In the presence of some substances (Appendix 8) the human metabolism is not able to digest and assimilate nutritive components such as protein, mineral nutrients, vitamins, or carbohydrates (FAO 1998, 1999, 2000b). The microorganisms reduce or even totally break down most antinutritional substances. That increases the digestibility, quality, and safety of food products noticeable (Dirar 1993, FAO 1998, 1999, 2000b). Fermented products have a sour pH factor (< 6.5) or are alcoholic. The sour or alcoholic environment prevents the reproduction of noxious or toxic microorganisms and destroys them. Thus, the risk of undesirable microbial activities is reduced and the safety of the food products increases (FAO 1998, 1999, 2000b).

Some fermented products even have medical effects. Certain microorganisms and moulds, which are part of the fermentation process, can develop antibiotics. Lactic acid bacteria, which are one of the most widespread microorganisms in food fermentation, have a positive effect on the intestinal flora. That leads to a better assimilation of nutrients and strengthening of the immune system (FAO 1998).

8.4 Processes of Fermentation

Fermentation can be described as a slow enzymatic decomposition of organic substances induced by the activity of microorganisms. The most important microorganisms of a successful fermentation are bacteria, yeast, and moulds[75] (Appendix 9) (FAO 1998). Traditional fermentation is a simple process which can be done without any complex technology. All over the world different raw products get fermented – cereals, fruit, vegetables, legumes, roots and

[75] Moulds do not play an important part in the fermentation of foods. They are mainly known for undesirable activities still there are some genus which are important for food fermentation e.g. cheese making.

tubers, meat, milk, and fish. For the fermentation the prepared (e.g. cleaning, peeling/ shelling, chopping, grinding) raw material is put into a receptacle, water is added and some salt or sugar depending on the product (Campbell-Platt 1987, Dirar 1993, FAO 1998). To start the process a starter culture is needed which can be taken from the previous fermentation (FAO 1998). In a hot environment for most traditional fermentation a starter is not necessary as the natural environment contains enough desirable microorganisms to start the fermentation. Nevertheless, a starter accelerates the process and secures a successful desirable fermentation to some degree. Depending on the product the process can take a few hours up to days or weeks (Campbell-Platt 1987, Dirar 1993, FAO 1998).

The process of traditional fermentation is a natural process in a non-sterile environment. This non-sterile environment is necessary for a successful fermentation. That can lead to certain risk since the process is not controllable. Spoiling of the process can be caused by the growing and reproduction of undesirable, noxious, or even toxic cultures. Hence, it is important not to use contaminated (e.g. infected by fungi) raw products and to use clean receptacles and water (Dirar 1993, FAO 1998).

8.4.1 Yeast Fermentation

Yeasts are unicellular organisms that are widely distributed in nature. They are very important for the food fermentation as they produce enzymes for chemical reactions. Yeast fermentations are famous for the leavening of bread and the production of alcoholic beverages. Yeasts decompose simple sugar as glucose and fructose into ethyl alcohol. The most favourable yeasts for desirable food fermentation are from the Saccharomyces family (FAO 1998).

Equation 1: Yeast fermentation of glucose to ethyl alcohol and carbon dioxide (FAO 1998: 23)

$C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$

For the fermentation process yeasts need a basic substrate such as sugar. For the process itself oxygen is not necessarily needed but yeasts require oxygen for their growth (FAO 1998). It has to be paid attention to the fact that at the presence of oxygen and other microorganisms (e.g. Acetobacter) it might be possible that an undesired fermentation happens which might oxidise the alcohol to some forms of acetic acid[76].

The temperature range for the activity of yeasts is between 0 and 50 °C, with an optimum of 20 °C to 30 °C (FAO 1998). For their activity yeasts require water. Yeasts prefer a neutral environment (pH 7.0) but are tolerant towards a sour environment and can grow in a pH of 4.0 to 4.5 as well (FAO 1998). Furthermore, yeasts are very tolerant towards sugar and grow well in a solution of 40 per cent sugar (FAO 1998).

[76] For example, this sometimes happens in vine production. If vine has a too high excess of oxygen and Acetobacter are present it easily oxidises into vinegar.

8.4.2 Bacterial Fermentation

Bacteria are unicellular organisms. They are present in soil, air, water, living beings, plants, and organic material all over the world. Normally bacteria are seen in the context of diseases and spoilage, nevertheless some are very important for the fermentation of food such as the lactic acid bacteria (Lactobacillaceae) and acetic acid bacteria (Acetobacter species) (FAO 1998).

Lactic acid bacteria are anaerobic, gram positive, non-spore forming, and immobile bacteria (Brockhaus 2002). For their energy demand they produce lactic acid from carbohydrates (FAO 1998). The lactic acid bacteria, perhaps the most widespread microorganisms in food fermentation, are very important for the fermentation of dairy products, cereals, grain legumes, and meat. Acetic acid bacteria are aerobic, gram negative, immobile, or mobile bacteria (Brockhaus 2002). They can produce acetic acid from alcohol (FAO 1998). The acetic acid bacteria play an important role for the fermentation of fruit and vegetables.

The lactic acid bacteria can be divided into two main groups: the homofermenters and the heterofermenters. Homofermenters produce mainly lactic acid from carbohydrates (glucose) along the glycolytic pathway (FAO 1998). Heterofermenters produce lactic acid as well as ethanol, acetate, and carbon dioxide along the 6-phosphogluconate/phosphoketolase pathway (FAO 1998). Most of the Lactobacillaceae follow the glycolytic pathway which requires carbohydrates and limited oxygen (FAO 1998).

Equation 2: Homolactic fermentation – production of lactic acid from glucose by lactic acid bacteria (carbohydrates → lactic acid) (FAO 1998: 44)

$C_6H_{12}O_6 \rightarrow 2\ CH_3CH(OH)COOH$ (or 1 Hexose + 2ADP + 2Pi ➞ 2 Lactate + 2 ATP)

Equation 3: Heterolactic fermentation - production of lactic acid, ethanol and carbon dioxide from glucose by lactic acid bacteria (carbohydrates → lactic acid + ethanol + carbon dioxide) (FAO 1998: 45)

$C_6H_{12}O_6 \rightarrow CH_3CH(OH)COOH + C_2H_5OH + CO_2$

(or 1 Hexose + 1 ADP + Pi ➞ Lactate + Ethanol + CO_2 + 1 ATP)

Acetic acid bacteria produce acetic acid (vinegar) from fruit juices or ethanol. The production of vinegar takes place in two stages. The first step is the fermentation of sugar into ethanol by yeast (cf. equation 1). The second step is the oxidation of ethanol under the influence of oxygen into acetic acid and water (FAO 1998). Therefore, an oxygenous environment is necessary for the activity of Acetobacter.

Equation 4: Oxidation of ethanol to acetic acid by acetic acid bacteria (ethanol + oxygen → acetic acid und water) (FAO 1998: 46)

$C_2H_5OH + O_2 \rightarrow C_3COOH + H_2O$

The bacterial fermentation requires a particular environment that is specific for every kind of bacteria. Generally the bacterial activity is determined by: (Campbell-Platt 1987, FAO 1998):

- Temperature: the optimum lies between 20 and 30 °C
- Salt concentration: lactic acid bacteria have a relatively high salt tolerance compared to others. That inhibits the activity of undesired microorganisms.
- Water activity: the majority of bacteria require a lot of water otherwise microorganisms with a smaller water demand (yeasts, fungi) will dominate the process.
- PH factor: most bacteria prefer a neutral environment (pH ~ 7.0). Some species are acid tolerant e.g. Lactobacillaceae family.
- Oxygen availability: some of the bacteria are aerobe others anaerobe. In aerobe fermentation oxygen can be one of the limiting factors.
- Nutrients (composition of the food): all bacteria have a very high demand for nutrients for their metabolism. The fermentation bacteria need carbohydrates which provide the energy for their fermentation activities. This can be simple sugar as glucose or complex carbohydrates as cellulose or starch.

8.5 The Impact of Fermentation on Meal Security

Worldwide fermentation of food is of great importance for meal security. Especially in rural areas in Africa, Asia, and South America fermentation is a guarantee for the food supply of the people (FAO 1998). Traditional fermentation is a simple and reasonable conservation method which requires only little energy and non-complex technologies. Fermented food has an increased shelf life. Hence they are an important resource in time of food shortage (FAO 1998, 1999, 2000b).

Those affected by an insufficient food supply can improve their diet significantly through fermented food. In most developing countries the human diet is rich in fibre (cereals, roots, tubers) and poor in protein (meat, pulses). Fermentation improves the nutritional value and flavour of the food. In addition, through fermentation, products, which are not suitably for the human diet, can be processed into valuable food products. Some human societies use by-products or waste products to prepare fermented food. For example, press cakes from edible oil processing once fermented are a very energy-rich food product. In Sudan some tribes ferment animal bones, hides, or even urine for the human diet because they are rich in protein and mineral nutrients. Many so-called famine foods are fermented products which are an important food source in times of food shortage (Dirar 1993, FAO 1998).

9 Staple Food of Sudan

This chapter introduces some of the major staple food which is important for the daily diet of most Sudanese people. This selection contains some food which is indigenous and has been known in Sudan for a long time as well as some which are relatively new and have been introduced during the colonisation.

Sudan is a country with a food gap. Many citizens suffer from malnutrition, deficiency symptom, or hunger. It is important to have a close look at the nutrient components of the food and

its importance for the human diet and health status. As the food is not eaten raw but processed into a dish under technological and cultural influences, it is necessary to look at the preparation qualities of the raw product and the preparation methods in addition to biological and nutritional characteristics.

9.1 Grains – Sorghum, Pearl Millet, and Wheat

9.1.1 Sorghum

Origin of Sorghum

Sorghum (*Sorghum vulgare* or *bicolor*) originates from the eastern part of the Sahel in the region from Lake Chad to the Ethiopian plateau. It was domesticated about 7,000 years ago in the area of the Sahel zone and the Nile Valley. Sorghum was spread all over Africa, Asia, and America via trade routes like the Silk Road or through slave trade (Dirar 1993, FAO 1995).

Biology and Ecology of Sorghum

Sorghum (Figure 7) is an annual small-grained cereal and belongs to the family of the Gramineae. Cultivated sorghum is divided into five races (bicolor, guinea, caudatum, kafir, durra) with more than 36 varieties. Durra and caudatum are the most common groups in East Africa, whereas durra is the most common race in Sudan (FAO 1988b, 1989a, 1995).

The sorghum plant has a single stem and grows up to a height of 0.5 to 2.5 m with 7 to 24 narrow spear-like blades. These can be 30 to 135 cm long and 1.5 to 13 cm wide depending on the variety. The plant produces a large number of much-branched lateral roots which spread laterally up to 1.5 m (FAO 1988b, 1989a, 1995). The flower heads are panicles and vary in shape and size with an erected or curved flower stalk depending on the variety. The seeds are covered by glumes and the seed colour differs from pale yellow to red brown and deep purple. The seeds are spherical but can vary in shape and size from 4 to 8 mm. The endosperm of the seed is fully covered by the pericarp. Beneath the pericarp lies the testa. Both contain pigments, additionally the testa contains tannin. Especially darker varieties have a high tannin content. Tannin creates a bitter taste and diminishes the digestibility of protein and starch (FAO 1988b, 1989a, 1995). The advantage of tannin is the protection of bird and pest damage. The husk of the sorghum seed is very hard and barely pervious for water which makes it suitable for storage but also more difficult to process.

Sorghum favours semi-arid climates (rainfall: 200 to 700 mm) but can also be cultivated in temperate climate successfully. The plant is drought resistant and has a low demand on soil nutrients or fertiliser. Both, light sandy soils and heavy clay soils are suitable for the cultivation of sorghum. The optimal growing temperature is 27 to 30 °C and the plant is very sensitive to frost (FAO 1988b, 1989a, 1995).

The Importance of Sorghum in the Sudanese Culture

Sorghum has been consumed for thousands of years in Sudan and was already one of the main staples during Meroitic times (about 690 BC – 350 AD). As sorghum is the main staple in

Sudan the Sudanese are called ‘sorghum eaters’ (Dirar 1993). The sorghum produced in the country in theory is enough to keep the population in good supply. The crop is grown in almost all regions of Sudan. The main production areas are the heavy clay soils in Central Sudan under mechanised cultivation. Even in North Sudan where wheat and in the West where millet are the traditional main staple, sorghum is consumed to a large extent.

Sorghum is a multi-purpose crop. The grains are suitable for the human diet and are prepared as dishes or beverages. Leaves, stem, and grains are used as fodder. The stem and leaves are also used as building material. Moreover, sorghum is traditionally utilised as medicine. A prepared drink from the seeds called ‘galiya’ is used to cure infections of the respiratory tract, loss of appetite. Sometimes it is even used as substitute for coffee (Dirar 1993).

In many regions of Sudan sorghum traditionally was called ‘aish’ which means ‘life’. Today the common name for sorghum is ‘durra’ or ‘thura’ named after the most common race of sorghum in Sudan (Dirar 1993). The western style wheat bread is now called ‘aish’.

Storage, Processing, and Preparation Methods of Sorghum

Commercially sorghum might be stored in warehouses or silos but traditionally it is stored in underground pits and clay pots. Yet, the moisture in the grain should not exceed 11 per cent otherwise the grains spoil easily. Sorghum varieties with a darker colour tend to be softer than brighter varieties because of the floury endosperm. Therefore, the darker varieties are easier processed by hand but they are also more susceptible to insect damage under storage. Still, the softer/ darker varieties are less vulnerable to fungal damage in the field and under storage because of the higher tannin content (FAO 1995).

The processing and preparation of sorghum is the responsibility of the women (from unmarried girls up to married women of every age). Most of the traditional technologies of sorghum processing are very time-intensive, monotonous, and done by hand.

Traditionally, in rural households sorghum is ground by hand. Households usually own two stony hand mills (*murhaka*) which are made of a base plate and a long cylindrical roller. One mill is for the dry milling of the grains with a rough surface, and one is for the wet milling of soaked flour or dough with a smooth surface (Dirar 1993). The grinding is a daily process.

The grain is carefully sifted and riddled to clean it from dirt, soil, and glumes. Sometime the grain is washed with water and sun dried. With the first grinding a coarse meal is produced called ‘derish’. To get fine flour called ‘degig’ the ‘derish’ has to be ground again. The coarse meal is left for fermentation overnight by adding water and a portion of previous dough as a starter. The next morning the fermented dough is ground again until it is an elastic and viscous mixture called ‘ajin’ (dough). Usually ajin is either directly used to prepare a dish or moulded into small balls and sun dried for storing (Dirar 1993).

Today modern mills produce fine flour (degig) which is mixed with water and fermented. Depending on the individual preferences the dough is left for fermentation just for a few hours or overnight. The ajin is not ground again since the used flour is already fine. This ajin usually is very soft and liquid which makes it almost impossible to sun-dry.

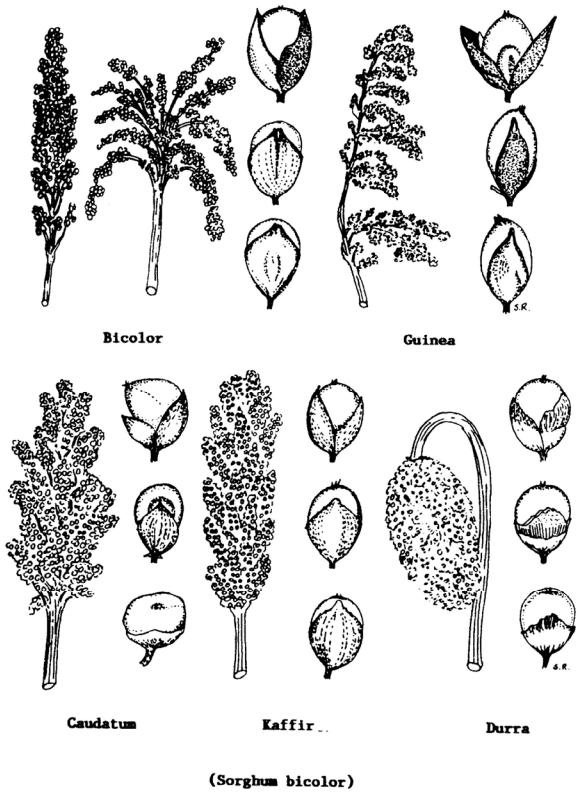

Figure 7: Sorghum (*Sorghum bicolor*) (FAO 1988b: 469)

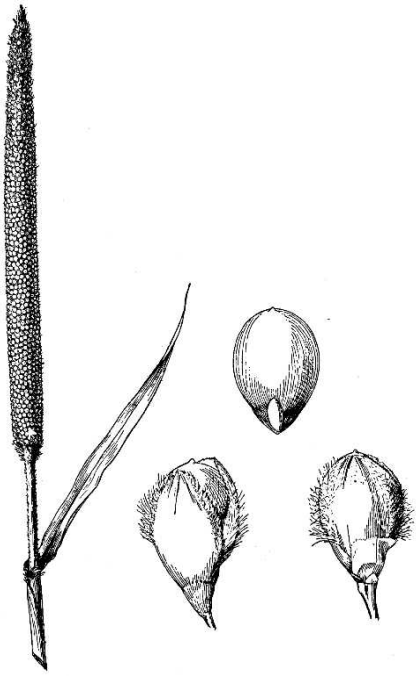

Figure 8: Pearl millet (*Pennisetum glaucum*) (USDA-NRCS 2006)

Figure 9: Wheat (*Triticum aestivum*) (USDA-NRCS 2006)

The modern mills are small mills which are found numerously in urban areas and widely even in rural areas. The customer takes his produced or bought grain to the mill for grinding. Some mills sell different kind of flour (from different kind of sorghum, millet, wheat) directly. The invention of modern mills is a big relief for the workload of girls and women.

However it has been proved that hand ground sorghum flour has a higher nutrient content than flour from modern mills. The traditionally prepared flour has a higher protein content (especially thiamine[77]) and a better digestibility (Dirar 1993). The traditional sorghum variety feterita is very suitable for hand grinding because of its completely floury endosperm. In contrast improved hybrid sorghum varieties have a fully corneous endosperm which makes hand grinding impossible (cf. Dirar 1993: 77).

The Importance of Sorghum for the Human Diet

Sorghum is very suitable for the human diet and builds an important basis for the nutrition of the Sudanese. The seeds are rich in carbohydrates and protein. Even if the protein content is quite high (∅ 12.6 per cent) the protein is of low quality and limited by the low lysine content of an average of 2.1 per cent (Dirar 1993). The main contributors to the protein are the germ and the endosperm. The lipid content is relatively high with about 3 per cent mainly found in the germ and the aleurone layers. Sorghum is rich in B-complex vitamins and vitamin D, E, and K are present.

Sorghum contains several antinutritional substances. Phytate, mainly present in the hull, binds iron and other minerals and makes them unavailable for the human metabolism (FAO 1995). Besides that sorghum contains a relatively high amount of polyphenols, especially tannins. It is found in the endosperm and has the role of chemical protection of the plant from pest attacks or fungi. The tannins affect the nutritional quality of the grain. They bind protein and enzymes thereby lowering the digestibility. The antinutritional content of sorghum is no argument against this grain. Most of the grains (e.g. wheat, barley, rye, maize) contain antinutrients and legumes have a significant content of tannins. There are several methods to reduce the content of antinutrients and improve the quality of the grain. Dehulling removes significant amounts of phytates and tannins, the germination of grains in moist ash of wood reduces the tannin content. Furthermore, fermentation improves the availability and digestibility of minerals and protein (Dirar 1993, FAO 1995).

Prestige of Sorghum

The most common and one of the cheapest sorghum varieties in Sudan is feterita. It is of brownish colour and therefore its flour and dishes are brownish, too. The spreading, the low price, and the colour give feterita the image of being the food of the rural and poor. Feterita is the type of sorghum that everybody can afford and which is consumed when the household does not have enough money to by more expensive food. Even if lighter coloured sorghum

[77] Thiamine = Vitamin B1; in form of the coenzyme thiamine pyrophosphate it supports the digestion of carbohydrates (Documenta Geigy 1968)

has been consumed in Sudan for many centuries, the colour never had this social status like today. Usually different types of sorghum are used for different dishes not only because of their appearance but because of their quality. Through the introduction of western-style white bread through the British white or bright coloured sorghum products have gained more and more importance and have become a status symbol especially in the cities (Dirar 1993).

The strong influence of the urban on the rural areas causes a preference for light-coloured sorghum products even there (Dirar 1993). For several years wheat has been the strongest competitor for sorghum. Wheat, traditionally grown in northern regions was never of importance for the rest of the country as the climate is not suitable for its production. Since the British times and the introduction of western-style bread, wheat has become of bigger importance. Especially in the towns wheat has developed into a symbol of social status and urban lifestyle (Dirar 1993).

Urban citizens of the upper strata and the elite are prejudiced against sorghum. Sorghum is the food of the poor and its consumption is considered as reactionary. In contrast the consumption of wheat is considered progressive and modern. Even if wheat has a better protein content than sorghum traditional preparation methods like fermentation revalue the protein content and quality of sorghum products in contrast to no improvement of the nutritional value in the making of western-style bread from wheat.

The negative approach towards sorghum originates from colonial times during which the culture and traditions (and therefore the food habits, too) of the indigenous people was considered as backward and primitive and was suppressed or even destroyed. During the British times the Sudanese hardly had access to white bread. With the independence in 1956 western-style wheat bread became more and more popular at the expense of sorghum dishes.

9.1.2 Pearl Millet

Origin of Pearl Millet

Pearl millet (*Pennisetum glaucum*) originates from tropical western Africa where it was domesticated about 5,000 years ago. About 2,000 years ago it was carried to eastern and central Africa as well as India via the trade routes (FAO 1995, Haaf 1991).

Biology and Ecology of Pearl Millet

Pearl millet (Figure 8) is an annual, small-grained cereal and belongs to the Gramineae. Pearl millet is considered as one species which is divided into cultivars races by the time they need to mature (early millets: 60 to 95 days, late millets: 130 to 150 days) (FAO 1988b, 1995).

The plant can reach a height of 0.5 to 3 m. Branches develop in variable amounts, depending on the cultivar. The stem has nodes and the leaves are pointed with or without hairs and can reach a length of 30 to 100 cm (FAO 1988b, 1989a, 1995). The flower heads are cylindrical and erected and can be long and thin or short and thick. The grains are close-packed on the panicle and have a diameter of less than 4 mm. Still, they are larger than the ones of other millets. The seeds vary in shape, colour (nearly white, yellow, brown, grey, light blue or pur-

ple), and size depending on the cultivar. The endosperm fully covers the seed and is completely fused to the pericarp. The testa of the pearl millet kernel in contrast to sorghum is very thin and only sometimes pigmented. The relative proportion of the germ to endosperm is higher than in sorghum (FAO 1988b, 1989a, 1995).

Pearl millet is drought-resistant and grows as a rainfed crop in semi-arid climates. It requires less rain than sorghum but needs an even rainfall distribution during the growing season. It does not have the ability as sorghum to halt growth during drought periods. Still, it is more suitable to sandier and drier areas than sorghum. In the lowest rainfall areas early maturing cultivars are used, with increasing rainfall late maturing cultivars are more common. The crop does not tolerate waterlogging and it grows best on well-drained soil, preferring light sandy soils. Even with low soil fertility it gives reasonable yield. The optimum growing temperature should be high at daytime and cool at night (18 to 27 °C) (FAO 1988b).

The Importance of Pearl Millet in the Sudanese Culture and the Human Diet

Traditionally, pearl millet, called ‘dukhun’, is the most important grain of western Sudan. Especially in Darfur and Kordofan people consume pearl millet and prefer it to sorghum. Pearl millet is more suitable for the semi-arid climate and the sandy soils of the West. It is believed that pearl millet is more nutritious than sorghum. If dukhun is eaten for breakfast, it will satisfy the consumer all day because it fills up the stomach better than sorghum. The pearl millet of western Sudan has a very bright yellow colour which gives the dishes an intense yellow colour never reached by sorghum. In addition, pearl millet tastes more aromatic.

Pearl millet is grown in traditional rainfed agriculture. The workload for growing pearl millet is very high and the sandy soil makes the use of machines impossible. The loss of soil fertility is one reason of the continuous increase of the production area. Not following a rotation and exhausting the soil by annual utilization leads to a further decrease of the yield. With the drought years in the 1980s and in 1990 the yields were even lower and the people in Darfur and Kordofan had to switch their staple to sorghum especially, as it was easier available being distributed as food aid. However, this is not seen as an improvement. Eating sorghum for many people means to be poor and not able to afford buying pearl millet. Some also believe that sorghum is not even good enough to feed to animals. For the last 20 to 30 years sorghum has become more important to the western regions. Meanwhile, pearl millet becomes more and more a food for special occasions. Up to day pearl millet is more expensive than sorghum but shows less seasonal price fluctuation.

Pearl millet is compared to sorghum and other millets very high in protein (9 to 21 per cent, depending on the cultivar) and oil. This is because of the big size of the germ which is very rich in protein (19 per cent) and oil (32 per cent). Like other cereals pearl millet mainly contains starch. It also is an important supplier of B-complex vitamins and iron (FAO 1995). The viscosity of pearl millet flour is lower than that of sorghum which makes pearl millet badly suitable for making kisra.

Storage, Processing, and Preparation Methods of Pearl Millet

The storage, processing, and preparation of pearl millet are similar to sorghum. The storage mainly happens in traditional ways. Pearl millet cannot be stored as long as sorghum because of the high oil content it spoils easier. Furthermore, pearl millet is much more attractive to pest damage (birds or insects). The preparation of pearl millet dishes is similar to sorghum and exclusively done by women and girls.

Moreover, pearl millet is used to prepare a beer call marissa. This drink made from fermented pearl millet is deeply rooted in the nomadic and rural culture of Kordofan and western Sudan. It not only used to have the same importance as tea and coffee have today but was drunk on social events too and was used as a staple. Since the start of the Islamisation in the early 1980s marissa, which is alcoholic, is prohibited.

9.1.3 Wheat

Origin of Wheat

Wheat (*Triticum aestivum*) originates from the Fertile Crescent in Southwest Asia. It was cultivated from the wild einkorn (*Triticum monococcum*) which was domesticated about 9,000 years ago. About 8,000 years ago emmer wheat (*Triticum dicoccum*) became the primary ancestor of today's wheat with larger seeds than the einkorn (Brockhaus 2002). Today wheat is grown all around the world and is the second largest grain crop after maize. In Sudan wheat is traditionally grown in the north of the Nile Valley. For many decades it has also been cultivated in the irrigation schemes where it has been a main crop for many years.

Biology and Ecology of Wheat

Wheat (Figure 9) is an annual cereal and belongs to the family of the Gramineae. There are many different wheat species. The major cultivars are common wheat (*Triticum aestivum*), durum (*Triticum durum)*, einkorn (*Triticum monococcum*), emmer (*Triticum dicoccum*), and spelt (*Triticum spelta*) (Brockhaus 2002). Common wheat is the main bulk of wheat consumed in Sudan.

The wheat plant develops one shoot with 4 to 6 tillers whereas each stem has several nodes. The nodes separate the shoot into units each having a node, a leave, a bud in the axil of the leave, and an elongated internode (the top four to seven internodes). The leaf is divided at the ligule into a cylindrical sheath which embraces the stem and the flat long blade. The flower heads are ears carrying about 20 to 26 spikelets whereas each spikelet has two to four seeds. The seed is oblong and has a crease on the ventral side and the distal end has a brush of fine hairs. The endosperm is covered by the aleurone layer, the testa, and the pericarp. The plant has two types of roots: seminal and nodal roots. The primary root with its lateral root forms the seminal root system which is grown from the seed. They mainly grow into the depth up to 2 m. The nodal roots develop from the lower three to seven nodes with the start of the tillering. They are thicker than the seminal roots and grow horizontally (FAO 2002a).

Wheat is adapted to a wide range of climates. The plant requires sufficient supply of nitrogen and other soil nutrients. The optimum growth temperature is 15 to 25 °C. Worldwide most of the wheat is grown in regions with 375 to 875 mm of annual rain. Still, wheat can grow in colder, hotter, drier, and wetter climate but with lower yields. Too much light and hot temperature prevents tillering which leads to significant yield losses. High temperature are a limiting factor for the yield because the plant grows too fast which means less time to develop seeds (FAO 2002a).

Importance and Prestige of Wheat in the Sudanese Culture

Traditionally, wheat has been consumed in the northern regions along the Nile Valley for many centuries. The cool winters and the traditional irrigation at the Nile Bank allow wheat to produce satisfying yields and made it to a staple in this area.

Wheat has been of growing importance in Sudan since the independence. White bread had been already invaded Sudan during the British rule as it was mainly the staple of the British elite and government officials. This made wheat to a prestigious product which spread more and more through urban areas. With the independence the Sudanese government ambitiously started to produce wheat in the irrigation schemes to satisfy the demand of the growing urban population. Wheat has the image to be a modern and progressive crop – so its consumption makes people more progressive and modern. Hence, the government policies aimed to produce wheat inside the country and create a demand for wheat through propaganda.

Today wheat is the second most important cereal in Sudan. Even if wheat flour is more expensive than sorghum flour, wheat bread is cheaper than kisra since it is commercially produced in huge amounts in bakeries. Especially in urban areas wheat in form of white bread is the main staple and is the most consumed cereal. Since the yields are low and the production is very cost- and input-intensive the Sudanese wheat production is limited. Hence, most wheat is imported.

The Importance of Wheat for the Human Diet

Wheat is very suitable for the human diet because it is rich in carbohydrates and has a relatively high protein content (10 to 12 per cent). The main form of protein is gluten which is the reason for the elasticity and the open texture of fermented wheat flour products. The main contributor for protein is the aleurone layer and the germ. As in sorghum and pearl millet the protein quality of wheat is limited by the low lysine content (2.7 per cent). Unfermented wheat has a higher digestibility than unfermented sorghum because wheat does not contain so many anti-nutrients (Dirar 1993, FAO 1989a).

Processing of Wheat

Wheat is mainly used as flour to prepare food products. Traditionally, wheat has been ground between two stones by hand. First the grain is ground into coarse particles and the lighter fibrous bran is winnowed or sieved away. The remains are grounded into flour. Today most of the wheat in Sudan is milled commercially. A big amount of the imported wheat is already imported as flour.

The objective of milling is to remove the bran from the endosperm of the grain which reduces the fibre content of the product. By removing the bran vitamins and minerals are also removed. Furthermore, the germ is removed so the flour only contains a limited amount of fat which reduces the risk of rancidity during storage but also reduces the nutritional value of the flour. In home milling only a small proportion of the fibre and bran is removed therefore the vitamin, mineral, and protein loss is not very high. The nutrient loss in commercial milling depends on the extraction rate (FAO 1989a).

The major bulk of wheat in Sudan is processed into white loaf bread which is exclusively produced commercially and is the main staple food in the urban areas.

9.1.4 Grain Dishes – Aceda, Kisra, and Gurassa

Aceda

Importance of Aceda for the Sudanese Diet

The Sudanese diet includes several kinds of thin liquid up to thick stiff porridges. They differ by ingredients, preparation method, or occasion of consumption. The most important stiff porridge is *aceda*. In some regions of Sudan aceda is consumed daily. It is one of the most important dishes in the Sudanese diet and indigenous to Sudan.

Fermented stiff porridge with sauce is one staple food in western Africa which came to the Nile by the west-east movements. In Sudan aceda can be made from cereals, cassava or other roots and tubers, wild grasses or famine food (Dirar 1993). Depending on the region and production area aceda traditionally was prepared from sorghum (Nile Valley and East), millet (West), or cassava (South). Today aceda is mainly prepared from sorghum and wheat even in the western parts of Sudan because of the shortage of millet and changing consumption patters. Usually aceda is prepared from fermented sorghum dough (*ajin*). Depending on the ingredients aceda has different colours. Millet gives a brownish-yellow aceda, sorghum (feterita) a brownish-grey aceda and brighter coloured sorghum cultivars or mixed with wheat (or wheat only) make a very pale whitish aceda.

In rural areas especially in the West aceda traditionally is consumed for all meals. A stew/ sauce is poured over the porridge, and it is eaten with fingers. The sauces are very diverse and can be made of pure water, milk, vegetables, or meat (Dirar 1993). In the urban areas aceda is hardly consumed anymore instead kisra and wheat bread are eaten.

It is believed that the best aceda is made from feterita because it gives more energy than other sorghum cultivars (Dirar 1993). Aceda is not only used as a staple food. It is also used to prepare moss. Aceda is dried, pulverized, and stirred into water. With sugar added it is used as a

fattening food for young brides[78]. A very thin moss is also used as thirst-quencher to people who are very thirsty or hungry (Dirar 1993).

Preparation of Aceda

Traditionally aceda was cooked in a clay pot (*burma*). Today every household owns at least one metal pot called *tajin* or *hala* to prepare aceda. Metal kitchen utensils are probably used since the British times (1898 – 1956) when the steel industry was introduced to Sudan (Dirar 1993). Traditionally, a heavy round spherical-like pot (*hala bramo*) is used. The thick walls of the pot keep the aceda warm during the cooking; the round form makes it easier to control the aceda. It is easier to stir the aceda. For stirring a wooden stirrer (*mufraka*) is used.

To cook aceda water is boiled in the hala. Then the ajin is given into the water with permanent stirring. To get a smooth aceda the ajin is added in little portions and mixed in between. This is done until a thick well-cooked porridge is obtained. As soon as the aceda is ready cooked it is portioned into small bowls (plastic, metal, porcelain) where it cools down. The portioning used to be done with a special cutter called *mugta'a* (Dirar 1993) but today it is mainly done with a small saucer or a piece of plastic. During cutting the aceda, the mugta'a is dipped into cold water to prevent the aceda from sticking to it. Every household has different sizes of bowls depending on the serving. Traditionally aceda was served in a wooden bowl called *gadah* (Dirar 1993). Today it is usually served in a porcelain or metal bowl.

Depending on the household aceda is cooked on a gas stove which is more common in urban areas, on a charcoal stove (kanon), or a wood fire. Many women prefer to cook aceda on the kanon since they can sit next to it which makes the stirring easier. Moreover, the round pot sits much better on the kanon than on a gas stove.

To obtain a good and smooth aceda the cooking of aceda demands a lot of effort and skills. It needs a lot of practice and experience to receive good quality. The thicker the aceda gets during the preparation process the more complicated is the stirring which needs a lot of strength and stamina. In many households aceda is cooked by the older women who are most experienced. Once the porridge is thick, several defects can occur as a result of a faulty process. If the stirring is neglected, aceda can easily burn which affects the flavour or the aceda is only half-cooked. Experienced women press a wet finger on the aceda, if it does not stick to the finger the aceda is ready. Furthermore, it might happen that the aceda becomes lumpy when the portion of ajin added is too big and is not stirred and cooked very well.

Kisra

Importance of Kisra for the Sudanese Diet

Bread is not a traditional food in Africa. Porridge used to have a much higher importance for the daily diet. Still, there are several kinds of bread found in different African countries. In the

[78] In Sudan it is a beauty idol to be stout as a bride so married woman have enough energy to give birth to many children.

past in some regions the thick porridge aceda was called *kisra*, too. However, with the growing of villages and towns a paper-thin bread rose in importance for the daily diet and was given the name kisra (Dirar 1993). Even if kisra was not always associated with bread, kisra has been known since Meroitic times. At this time kisra (called *kissrat-kass*) was thicker than today's kisra but still thinner than the Ethiopian *injera*. The paper-thin kisra (*kissrat-gergeriba*) was probably introduced to Sudan during the Turko-Egyptian period (1821 - 1885). It has close similarities to the very thin Egyptian bread *abreh-jerjebida*. Kisra did not come, as aceda did, from the west to Sudan but from the north. In the towns kisra is the most important staple made from sorghum. Even if some people call it the main staple of Sudan it has to be taken into account that in many rural areas aceda is even more important (Dirar 1993).

Preparation of Kisra

Traditionally, kisra was prepared on a flat earthenware plate called *doka*. Like the burma the doka had to make way for a metal product (Dirar 1993). Today most household prepare kisra on a metal plate (*saj*) which in many cases is rectangular and flat and used on an open wood fire or is put on the kanon. Some modern urban households even have a kisra baking plate which is connected to electricity or gas.

The dough used for making kisra is the similar as for making aceda but the ajin is more liquid. The ration of flour to water after fermentation should be 1:1. The ajin for kisra usually ferments longer than for aceda (Dirar 1993) because the dough has to have a good viscosity to give an elastic and soft kisra. The saj is heated on a wooden or charcoal fire. Once the saj is very hot the ajin is given on it with a small cup, bowl, or ladle. The dough has to be spread immediately into a very thin sheet. Therefore, a rectangular piece (about 12x2.5 cm) of a palm leaf - the *gergeriba*[79] is used. As soon as the dough is spread the kisra is ready. The thin rim of the kisra dries of, shrinks, curls up, and releases itself from the saj. The size of the kisra varies between 20 and 45 cm depending on the saj. The thickness of the kisra is about 1 mm (Dirar 1993). The finished kisra is taken off the saj and put on a flat plate which sometimes is just a big plastic sheet. To prepare the saj for the next kisra it is rubbed with a piece of cloth (*mouaraka*) soaked in liquid fat. This is necessary to avoid the kisra sticking to the saj and also cleans off left bits of the previous kisra.

Usually kisra is baked once a day or every second day. It is usually done early in the morning because sitting next to the wood fire is very hot and exhausting in the hot weather. The baking of kisra is done exclusively by women. For a man it is considered undignifying to sit next to a saj. To bake kisra it needs a lot of practice, skills, and experience. A good kisra has to be elastic, smooth, as large as possible, without any wholes in the sheet and the sheets should not stick to each other. Kisra tastes best eaten fresh. Because of the hot and dry climate in Sudan kisra dries very quickly and cannot be kept longer than two days. Keeping kisra in plastic containers to capture the moisture increases the risk of fungi contamination.

[79] Today many women use a slightly elastic piece of plastic as gergeriba.

The preparation of kisra is very time consuming and needs a lot of fire material. Kisra is baked at home and some women sell kisra on the market or in the streets of urban areas. This business is not very profitable considering the effort of preparation (Dirar 1993).

Gurassa

Gurrassa is traditional to the northern provinces. It is a thick, soft, medium-size bread/ pancake. The preparation is very simple. Wheat flour is mixed with water into a smooth elastic semi-thick dough. Some yeast might be added to the dough and left for about three hours to rise. The dough then is spread and backed in a hot pan. A little oil might be used to avoid sticking of the gurrassa to the pan. The pan is covered and the gurrassa backed from one or both sides. Gurrassa might be eaten with *tabikh* or as a dessert with honey, sugar, or broken into milk. Its texture and appearance reminds of European pancakes and its taste is determined by the garnishing.

9.2 Roots and Tubers - Cassava

Origin of Cassava

Roots and tubers are important food crops for providing the human being with carbohydrates. Even if they originate from Latin America they are found all over the world today and play an important part in meal security. One of the most important roots in the southern Sudan is cassava.

Cassava (*Manihot esculenta*) is native to Latin America where it has been a staple food for thousands of years. It came to Africa through the Portuguese in the 16th century. In the 19th century cassava reached Asia. Today cassava is after sweet potatoes (*Ipomoea batatas*) the second most important tuber of the humid tropics. Cassava was introduced to Sudan as one of the last African countries in the late 19th century. It is mainly produced and consumed in the south of Sudan (Africalife 2000, Atlanta-Gruppe 2002, Brasilien.de 1999/ 2002, Dirar 1993, FAO 1977, 1989c).

Biology and Ecology of Cassava

Cassava (Figure 10) belongs to the family of Euphorbiaceae. The plant is a perennial shrub and can reach a height of up to 3.5 m. It develops tubers that radiate from the stem just below the surface of the ground. The flowers are of no importance for production purpose because the plant is grown from cuttings. The tubers are rich in starch and poor in protein. They have a brown skin and can reach a the length of 120 cm, a diameter of up to 15 cm and a weight up to 8 kg. The feeder roots grow vertically to the stem and tubers and can grow to a length of 50 to 100 cm (FAO 1977). This allows the plant to reach deeper water and mineral reserves of the soil in case of drought or low soil fertility. Cassava has a very high resistance to drought. In case of drought the plant develops smaller leaves to reduce the evaporation. The optimal environment for cassava are the humid tropics with a rainfall above 1,500 mm still it can also grow in drier climate (>500 mm). Furthermore, the plant has a very low demand for soil nutrients and fertilizer as well as care taking. Light sandy soils are favoured but it also has a

good yield on heavy clay soils. In case of the presence of many soil nutrients the stem and the leaves increase their growing on expense of the tubers. Cassava is sensitive to cold weather and stops growing at temperatures below 10 °C (Africalife 2000, Atlanta-Gruppe 2002, Cassava Homepage 2001, FAO 1977, 1989c).

Cassava has many different varieties which are commonly grouped into sweet and bitter cassava. The taste is closely connected to the content of the cyanogenic glucoside linamarine and lotaustraline (FAO 1989c) which is a natural protection against pest damage. The content of linamarine has to be taken into account for the preparation of cassava (Cassava Homepage 2001, Dirar 1993, FAO 1977, 1989c).

The Importance of Cassava for the Human Diet

Cassava is cultivated because of its starch-rich tubers which are a very important staple food in tropical areas. The cultivation is very simple and even under little care the yields are very satisfying. Especially during drought and times of food shortage cassava is an important source of food. Apart from starch the tubers are very rich in vitamin C although cassava alone cannot cover the human nutrient demand (FAO 1989c, Dirar 1993).

The whole plant has a high content of linamarine which makes the raw cassava indigestible or toxic depending on the variety. The content of linamarine varies within the plant. The leaves contain more linamarine than the tuber. In case of sweet varieties the tuber skin contains more than the tuber inside. In that case the tuber can be eaten uncooked after peeling. The bitter varieties contain the same amount of linamarine in the whole tuber. Nevertheless cassava is eaten worldwide. Peeling, soaking, boiling, and fermentation are the most common methods to make cassava digestible and non-toxic. Whole dishes can be made just from cassava. Young fresh leaves can be cooked as vegetables and a thick porridge can be prepared from the tubers. Unfortunately, most of the vitamin C of the tuber is lost through fermentation by contrast the vitamin C of the leaves is hardly affected by boiling (Cassava Homepage 2001, Dirar 1993, FAO 1977, 1989c).

Storage, Processing, and Preparation Methods of Cassava

Harvested cassava tubers are very unsuitable for storing. Because of enzymatic changes the tubers start to rot after a couple of days. By contrast the unharvested tubers can be kept in the soil for a very long time. So cassava is only harvested for direct use (Africalife 2000, Cassava Homepage 2001, Atlanta-Gruppe 2002, FAO 1977, 1989c).

Before the consumption of cassava the linamarine must be destroyed. The process of the detoxification is simple and relies mainly on the enzymatic hydrolysis of the glucoside. If the tuber is cut or peeled, the linamarine reacts under enzymatic influence into prussic acid (hydrogen cyanide = HCN) (FAO 1977, 1989c). Hydrogen cyanide is water soluble therefore the tubers can be peeled, cut in pieces, and rinsed in running water, soaked or fermented in plenty of water or heated. To significantly reduce or destroy the hydrogen cyanide one of these processes has to be done very thoroughly (FAO 1977, 1989c).

The processing of cassava in southern Sudan is as followed: the unpeeled tubers are soaked in running water, ponds, or big water barrels. After that they are fermented for three to four days. Then the fermented and soft tuber is peeled, cut into pieces and sun dried. The dried root is pounded into flour. This flour is directly used or stored for later use. Some tribes prepare a medium thick porridge from the flower similar to European mashed potatoes. Sometimes the cassava flour is mixed with sorghum to prepare kisra. A common cassava dish is a stiff porridge called *acedat-bakinde* which is eaten with sauce like aceda (Dirar 1993). The preparation methods of cassava in Sudan are very different from the ones in West Africa which are much more advanced as cassava has been known there for a longer time.

9.3 Sauces, Stews, and Meat

Sauces and stews are very important in the Sudanese diet. Looking at the staples aceda or kisra only is not enough to understand the concept of the human diet in Sudan. Cereal products are never eaten just by themselves. A sufficient and complete meal demands a supplement. Aceda and kisra are always eaten in combination with a sauce or stew[80] otherwise it would not be a meal.

The sauce has several functions. One is to provide additional nutrients. As discussed before a cereal product does not provide enough nutrients as it mainly contains carbohydrates. The sauce adds protein and vitamins. Another function of the sauce is to encourage the consumer to eat enough of the cereal dish to cover the energy demand. The amount of the cereal staple eaten at a meal depends very much on the availability of sauce. Moreover, the sauce improves the taste and texture of the food. A dry cereal dish would be almost tasteless and to dry too eat or to swallow. Sauces and stews of Sudan are divided into two groups: *mulah* and *tabikh*.

9.3.1 Mulah

Mulah is an indigenous Sudanese sauce that is typically eaten with aceda. For the consumption mulah is poured on the top of the porridge. Mulahs can contain different ingredients and vary in consistency and thickness but can be understood as a soup or gravy. Even if there are many kinds of mulah, most of them share some ingredients. Basic ingredients are water, onions, some oil, salt, spices, and dried powdered okra/ladyfingers (*weika*). Usually meat is a common ingredient too but its use depends on the availability and on the income situation of the household. Mulahs differ in those ingredients which provide the major nutrients and taste. The main ingredients also give the name. For example, *mulah leben* is mulah of milk, *mulah laham* of fresh meat, *mulah lubia* of cowpeas, *mulah rob* of rob etc. (Appendix 10). The list of different mulahs is guessed to be more than one hundred. Even if the porridge (e.g. aceda) is the same, as soon as the mulah differs in just one ingredient it is a different dish.

The poorest mulah is pure water, followed by soup-like porridge (*medida*) and *um-shieifa* which contains water, onions, salt, pepper, and weika. Another very simple and poor mulah is

[80] Even if the sauce is just water or milk.

um-rigeiga containing meat broth, salt, and weika. Even if um-rigeiga is a mulah of the poor it also is a very traditional dish which is found in wealthy households where it is served for special occasions. The richest mulahs are those which contain meat, like *mulah tagaliya* and *nieimiya*. The ingredients are minced or dried meat, tomato paste, onions, oil, spices, and the latter also contains rob and groundnut butter (Dirar 1993). They are so thick they hardly flow over the porridge. The preparation of mulah is very similar to making soup. The vegetables and the meat are boiled in water for a while to give a well-cooked dish.

One of the most important ingredients of almost all mulahs is okra. Usually it is used dried and powdered but for some mulahs the fresh pods (*bamia*) are used. Okra gives the mulah the mucilaginous character. This is very important for the viscosity of the dish. If the mulah is too liquid, it hardly sticks to the porridge and it is complicated to eat the dish with fingers.

9.3.2 Tabikh

Tabikh is not indigenous to Sudan. It originated from the Middle Eastern area and came to Sudan via Egypt in the times of the Turko-Egyptian rule (1821 -1885). As tabikh many of its ingredients such as vegetables were introduced to Sudan at the same time (Dirar 1993).

Compared to mulah, tabikh is much more nutritious and rich in ingredients. The preparation starts with the frying of chopped onions in plenty of oil. Then tomato paste is added plus water, meat, and spices. If the meat has cooked for a while, the other ingredients – vegetables are added. Again the tabikh is cooked for a while. For tabikh always fresh vegetables are used and just one vegetable at the time. Tabikh, like mulah, derives its name from the main ingredients – the vegetable. *Tabikh garrah* is tabikh with pumpkin, *tabikh batates* with potatoes, and *tabikh bamia* with fresh okra pods. The cooking time of tabikh is very long. A thick stew has to be obtained. This affords a lot of time and fuel. This and the ingredients make the preparation of tabikh very expensive. Tabikh has to contain meat and a lot of oil. It is an absolute must for a good urban household for every lunch. It is impossible for a better-off household to serve lunch without tabikh. In case of unexpected visitors not serving tabikh would be embarrassing and lead to rumours that the household does not have enough money or the wife is a really bad cook and does not take good care of the family. Even poorer urban household prepare tabikh when they expect visitors.

While aceda is only eaten with mulah but never with tabikh, kisra is sometimes eaten with tabikh. Still, it is very common to eat kisra with mulah. This is caused by its origins and eating traditions. Mulah is a traditional rural dish where people only eat aceda or kisra depending on the region. By contrast tabikh is a typical urban dish where people prefer bread. Tabikh is mostly eaten as a dip not a topping like mulah on aceda or kisra.

9.3.3 Okra

Okra/ lady's finger (*Hibiscus esculenta*), in Sudan called *bamia*, is grown in almost all tropical areas worldwide. Okra originates from Africa in the Nile Valley where it has been cultivated for more than 2,000 years. In Sudan okra is the most consumed vegetable and ingredient of almost every meal (FAO 1988b, Dirar 1993).

Okra (Figure 11) belongs to the family of the Malvaceae and is an annual herb which sometimes grows to a height of 3.5 m. The hexagonal to octagonal pods can reach a size of 10 to 15 cm and a diameter of 4 to 5 cm. The cultivation of okra is widely spread in the tropics because it is very well adapted to hot climate and grows on all kinds of soil without any special demands in the regions of 200 to 2,000 mm of annual rainfall. The optimum temperature is between 20 and 36 °C (FAO 1988b).

The nutrient composition of okra is very advantageous for the human diet. The pods and leaves contain high amounts of calcium, phosphorus, and vitamin A and B2. The seeds have a high protein and oil content. Furthermore, the pods have a high content of carbohydrates with a big share of mucilage, which is released during cooking and gives the dish a viscous consistency (FAO 1988b, Dirar 1993).

The pods are harvested when young and unripe and are used as fresh vegetable. In many cases they are processed to weika, therefore they are chopped in pieces, sun dried, and ground. Weika is used as thickener for sauces.

9.3.4 Meat

The majority of animals in Sudan are kept in traditional pastoral systems. Animals are also kept by settled farmers and sometimes in urban areas but in that cases the number of the animals is rather small and livestock breeding is not the main activity or source of income (FAO 2002b).

Meat is one of the most important foods in the Sudanese diet. Traditionally it is not an everyday food. Animals are slaughtered only for special occasions such as weddings, religious festivals, or visits by important guests. In urban areas, however, meat belongs to the daily diet of many households. Mainly it is consumed fresh and as minced meat or a dried and pounded powder. In towns mulah sometimes contains fresh meat but only in small amounts. Even tabikh does not contain lots of meat but it is more than in mulah.

If the meat is not consumed fresh, it is dried and fermented during the drying process. The consumption of dried fermented meat (shermout) is indigenous to Sudan and the most important way of meat consumption after fresh meat. The fresh meat is cut into strips and hung on a rope in the shade (indoor or outdoor). It takes less than a week to dry and ferment. Shermout has a strong flavour and rancid odour. It is stored in pieces in a container and pounded directly before consumption or pounded and stored as powder. It is always pounded for consumption and never used as stripes. Shermout is an important source of protein especially for poor and rural people. If fresh meat cannot be afforded, shermout is the main source of animal protein. In many areas (rural and urban) of Sudan mulah shermout is one of the most common and favoured sauces. Hence aceda with mulah shermout is one of the most typical Sudanese dishes.

Many urban households use fresh minced meat instead of shermout for the preparation of different mulahs. The mulahs of the minced meat have a different and milder flavour compared to the mulahs containing shermout.

9.4 Grain Legumes – Broad Beans and Chickpeas

Legumes are an important source of plant protein and energy in the human diet. Several pulses are consumed in Sudan, especially in urban areas. A large variety is found in the market and used for many different dishes. Therefore, just two legumes will be introduced which are very common in urban diets: broad beans and chickpeas.

9.4.1 Broad Beans

Origin of Broad Beans

The origin of broad beans (*Vicia faba*) is not clear. There are records about the cultivation of the plant in Mediterranean and Middle Eastern regions at about 3,000 BC. About 1,300 BC cultivars were introduced to Central Europe where it was a very important staple until the modern ages. In the Arab world broad beans are a daily food up to date (Schuster 1998).

Biology and Ecology of Broad Beans

The broad bean (Figure 12) is an annual plant and belongs to the family of the Fabaceae. The plant has tap-roots with many laterals whereas the main and lateral roots are well nodulated. The appearance of the plant varies strongly depending on the environment and kind of cultivar. In temperate climate the plant is erected and reaches a height of 80 to 120 cm. In dry climate the plant is low and with many branches. Primitive cultivars might be multi-branched without a main stem and lay down. The large leaves are without climbing tendrils. The flowers – varying in colours between white and purple - are in clusters (2 to 5 flowers) growing in the axils of the leaves. The pods are erected and vary in length (8 to 12 cm) and width (1 to 2 cm) with 2 to 8 seeds. The seeds vary strongly in shape, size, and colour. They can be a greyish yellow up to a dark brown, reddish, or greenish with a spherical or oval shape. The broad bean is divided into three varieties: large-, medium and small-seeded (Schuster 1998).

Broad beans have a very good adaptability to a changing environment. This is one reason why that plant is found in so many regions worldwide. For an optimal development the plant needs many soil nutrients and water during flowering (Schuster 1998).

The Cultural Importance of Broad Beans and Its Nutritional Aspects

Broad beans have a high status in many cultures. In ancient Egypt and Greece broad beans were considered as deity and were worshiped. In Greece, Rome and in Jewish tradition they were used for many dishes. In mediaeval times the whole plant and the beans were used in different ways (cooked, porridge, distillate, lye from the ash) as remedy for several diseases. Small roasted broad beans were also used as coffee replacement (Schuster 1998).

Grain legumes are very rich in protein. Especially the lysine content is very high (6.5 per cent) which is a limited protein in cereals (sorghum 2.1 per cent, wheat 2.7 per cent). The husk of pulses contains tannins and glycosides which have the function to protect the seed from pest damage and fungi. These anti-nutrients lower the protein digestibility. This can be

easily overcome by decorticating, cooking, germinating, or fermenting the legumes (FAO 1989b, Schuster 1998).

Storage, Processing, and Preparation Methods of Broad Beans

Broad beans are easy to store. Because of the hard seed coat they are hardly affected by pest damage. However, the longer the broad bean is stored the harder the seed-coat gets and the soaking ability decreases. Furthermore, valuable vitamin complexes get lost when stored longer than one year (FAO 1989b).

Broad beans as many other grain legumes have very hard seed coats and require prolonged cooking. The extended cooking is also necessary to reduce or destroy the toxic substances. This requires a lot of fuel. To reduce the cooking time the broad beans, as other legumes, are pre-soaked in plenty of water for some hours (FAO 1989b).

Ful-masri

Ful-masri or ful is a dish made from cooked broad beans with oil salt, pepper, and spices. Sometimes, depending on the preferences and income of the household, ful-masri is served with fresh spring onions, tomato salad, or white cheese. Usually ful-masri is eaten with white bread which is broken into pieces and dipped into the ful-masri.

Ful-masri is a very popular breakfast in Sudanese towns. Even if it is no indigenous dish it is very typical for Sudan. An urban breakfast without ful-masri is hard to imagine. Ful-masri is rich in energy and protein because of the broad beans, the oil, and the white cheese. Ful-masri (translated: Egyptian beans) actually originates from Egypt. There are no reliable records when ful-masri was introduced to Sudan but probably during colonial times (1898 – 1956) with increasing urbanisation.

The preparation of ful-masri is very time-intensive and needs a lot of fuel. Therefore, the broad beans have to be soaked overnight (at least for 12 hours) in plenty of water than have to be cooked for several hours. Many modern households own a pressure cooker which reduces the cooking time to about 30 minutes. Still, the broad beans have to be pre-soaked. The problem of long cooking time is solved by many little corner shops (dukan). These shops are found everywhere in the urban centres. They sell ready cooked ful-masri to a very reasonable price. In front of the shop usually stands a big spherical pot of ful-masri on a charcoal fire. This ful-masri is without any spices so the households can add the spices they prefer.

9.4.2 Chickpeas

Origin of Chickpeas

Chickpeas (*Cicer arietinum*) originate from western Asia in the area of Turkey about 5,500 years ago. Chickpeas have been cultivated for many centuries and spread all over the world. They are widely cultivated in India, the Mediterranean, the Middle East, tropical Africa, Australia, and Latin America (FAO 1988b). Especially in India and the Middle East chickpeas are part of the daily diet.

Figure 10: Cassava (Manihot esculenta) (Wikipedia 2006a)

Figure 11: Flowering and fruit bearing okra (*Hibiscus esculenta*)

Figure 12: Broad bean (*Vicia faba*) (Wikipedia 2006b)

Figure 13: Chickpea (*Cicer arietinum*) (AFRIS 2007)

Biology and Ecology of Chickpeas

The chickpea (Figure 13) belongs to the family of the Fabaceae. It is an annual plant of 30 to 100 cm height. The plant is dark green and all parts are covered with glandular hair. The roots are well nodulated with a strong tap-root and several laterals. The leaves are small leaflets in 3 to 9 pairs with a toothed margin. The flowers are solitary and can be of white, pink, purple, or blue colour. The pods are oblong of a length of about 2.5 to 3.5 cm and a width of 1 to 2 cm and contain 1 to 3 seeds. The seeds are spherical or angular with a diameter of 5 to 10 mm. The seed coat is white, yellow, red, or brownish (FAO 1988b).

Chickpeas are divided into four races: mediterraneum and eurasiaticum with large white seed, growing well under irrigation, and oriental and asiaticum with small seeds of different colour growing well in a dry environment (FAO 1988b).

Chickpeas are a crop of the subtropical climate with more than 400 mm of annual rain. They are resistant to drought and do not tolerate waterlogging. The optimum temperature lies between 18 and 29 °C. Especially in a late growth stage the plant is tolerant to higher temperatures. Chickpeas do grow in temperate climate but with very low yields and are sensitive to frost. The plants grow on a wide range of soil but with optimum yields on well-drained medium heavy clayey loams. They will also grow successfully on heavy clay soils. The plant hardly requires any fertiliser (FAO 1988b).

Chickpeas are very vulnerable to insect attacks; hence they should be stored in a closed basket or bag in a cool dry space.

The Nutritional Importance of Chickpeas

Chickpeas are very rich in protein, starch and contain more oil than most pulses. Furthermore, they are a good source for different minerals as calcium, phosphorus, and iron and contain many vitamin B-complexes (FAO 1988b). Chickpeas are used roasted, boiled, fried, or grounded for many different dishes.

Tamia

As with other grain legumes it is helpful to soak chickpeas before cooking to reduce the cooking time. If soaked well, the preparation of chickpeas is very simple. In Sudan chickpeas are mainly used to prepare *tamia* (falafel). For that the chickpeas are soaked for several hours. Then the soaked chickpeas, chopped onions, and garlic are put through the mincer to obtain a slightly crumbly paste. Salt, spices, some flour, and backing powder are mixed to the paste. Then the mixture is formed into small balls and fried. Tamia is not indigenous to Sudan but a very popular dish in the urban areas. It is eaten by itself, with ful-masri or in a sandwich. It probably came to Sudan from Egypt and the Middle East.

9.5 Dairy products

9.5.1 The Importance of Dairy Products in the Sudanese Culture

Milk and milk products are very important for the human diet in Sudan. For more than 5,000 years people on the Sudanese territory have been depending on cattle breeding and dairy products. Already before Meroitic time cattle was the most important domestic animal. Livestock breeding and nomadic life had been strengthened by the influence of nomadic Arab tribes who came to Sudan in the 13th century. Milk can be considered just as important as sorghum or millet in the Sudanese food culture. Milk and the consumption of milk are connected with many rituals, taboos, and spiritual believes (Dirar 1993).

The major bulk of produced milk is cow's milk which is produced by the herds of nomadic tribes. Due to the climate most of the milk is processed into fermented products which are mainly indigenous to Sudan (Dirar 1993).

9.5.2 Rob

Rob (fermented buttermilk) is indigenous to Sudan and most of the milk is fermented into rob. Rob is prepared in special containers that are only used for rob preparation or other dairy products: the *si'in* is a skin bag of Arab origin; the *bukhssa* is a large gourd and an African item. The bukhssa has a capacity of 5 to 10 l and the mouth is big enough to reach inside with one hand. From time to time the bukhssa is washed. The si'in is made of goatskin, is never washed and the remains of the rob are used as starter for further processing (Dirar 1993).

To prepare rob, fresh milk is given into the bukhssa or si'in and maybe some previous rob is added as starter. The milk is left overnight for the souring process. In the morning the milk is fermented and called *laban-rayeb*, *kit*, or *berkib*. In the early morning the container is churned and shaken to prepare rob and butter. During that process small quantities of cold water are added once in a while to speed up the butter production. This process prepares two products - one is a ball of butter which is removed, washed in cold water and stored in a special container and the other one is the rob which consist of sour milk with only a very small portion of lipid (Dirar 1993).

Rob can be seen as a by-product of butter production. It is not prepared as a food of it own, still rob a very important ingredient for many dishes. Today it is very common to call yoghurt rob even if it is a totally different product.

9.5.3 Samin

It is very uncommon in Sudan to use the butter as it is obtained from rob preparation. Since it contains traces of rob, water and other nutrients it cannot be kept very long in this raw state without spoiling and getting a rancid flavour. Therefore, butter is turned into samin (butter oil) by boiling it. The preparation of samin is a process which has to be carried out very thoroughly to expel all moisture and deposit all particulate matter (Dirar 1993). Boiling the butter divides it into two matters: small particles and a clear yellow oil – samin. Samin has a typical

light sweetish flavour. The hot clear samin is filtered through a fine cloth and stored in a container in a cold place where it can be kept for several months.

Traditionally, the preparation of samin is a process every woman can perform. Especially in nomadic tribes the samin preparation is a central element in the women's work. As the preparation process demands a lot of skills and knowledge it is mainly done by married and elderly women. Like the preparation of aceda and kisra, all activities concerning the samin preparation, storage, or even marketing are exclusively done by women. Samin even has many taboos concerning men. Men are not allowed to watch the preparation of samin or sell it on the market. A man is only allowed to sell it if his wife gives him a special permit (Beck 1988). This is a symbol to protect the independence and private sphere of the women. To praise a woman and her skills as a good wife and mother it is said that her hands are full of samin - "al-marra al- idha fiha samin" (Beck 1988: 374). This not only describes her skills in samin preparation but also her ability to keep the household free from hunger and crises (Beck 1988). If samin gets rancid, it reflects very badly on the women as she did not prepare the samin properly.

Samin is used for different purposes. Some use it to top a sauce – especially sauces from rob. Often it is used to prepare sweet dishes or little amounts of samin are added to a bowl before placing aceda in it. For the human diet samin is a very important source of energy. Especially in nomadic households it is one of the most important sources of energy during the dry season. As it is regarded as the best fat, it is sometimes even used as medicine to treat skin diseases or cure fever and rheumatism.

9.5.4 Jibna-beida

Sudan has no longstanding tradition of cheese making. Cheese had been unknown for a long time. *Jibna-beida* - white cheese is not indigenous to the country. It was introduced during the colonial times from Egypt and the Mediterranean countries. Up to date it is almost the only cheese produced in Sudan. In small shops the only other available cheese is imported spread cheese which is very expensive. Therefore, jibna-beida is the only reasonable and affordable cheese on the Sudanese market (Dirar 1993).

Jibna-beida is produced from fresh cow's milk (sometimes mixed with sheep or goat milk). The commercial cheese production depends on the milk from the herds of pastoral tribes. The cheese is mainly produced in farm-hut plants. The small mud huts are usually found in the outskirt of the major towns. In the morning the herdsmen deliver the fresh milk to the plant and the produced cheese reaches the town market without long travel (Dirar 1993).

The preparation method is as followed:

A fine cloth is stretched over a clean barrel and salt is put on the cloth, than the milk is poured into the barrel (about 200 l) through the cloth. Through this the milk is filtered and salted at the same time. The salt concentration should be between 6 and 10 per cent. After that about 10 g rennet tablets are dissolved in a little water and added to the milk which then has to be stirred for a couple of minutes. The barrel then is covered with a cloth and is left for 4 to 6 hours to let the milk coagulate. If the coagulation process is finished, the curd is put in to wooden moulds lined with a fine cloth and is placed on a wooden bench to drain overnight.

The draining whey is collected into buckets. The next day the obtained cheese is placed into cans in pieces of 5 to 10 kg. After that they are toped with the collected whey and sealed (cf. Dirar 1993: 335).

Jibna-beida belongs to the family of soft, pickled cheeses of the Balkans and Middle East. The cheese is ripened without moulds and is preserved by the saline solution which also improves the flavour (Dirar 1993). The white cheese is eaten with bread, pasta, or ful-masri.

9.5.5 Zabadi

Zabadi or yoghurt is another dairy product which is not indigenous to Sudan and mainly known by urban people. It probably came through Greeks, Syrians, and Turks to Sudan at the time of the Turkish rule (1821 - 1885). It is very likely that it became popular quite late after independence (Dirar 1993).

The preparation of zabadi is very simple and can be easily done at home. It is made from cow's milk which firstly has to be boiled. After cooling a batch of previous zabadi is added to the milk and then put in a warm place. The process of souring and thickening happens very fast and easy in the hot climate. Usually it only takes a few hours to ripe. Zabadi has a smooth viscosity with a thick body. Compared to commercially produced yoghurt it is sourer and varies in flavour. Depending of the length of the ripening process the zabadi can be mild or sour. Zabadi is used as in many other countries for different dishes as salads, sauces, sweet, or spicy. Some people do not call the product zabadi but laban-rayeb which means ripe milk.

In the major towns commercially produced yoghurt is available in selected shops. These are produced by employing culture starters and are standardised. These yoghurts can be compared to western industrial-produced yoghurt.

9.6 Famine Food

In the case of food shortage people might change their diet to some extent to wild and famine food. This mainly occurs if cereals are insufficient or not available. While wild foods are often medicines or spices in normal time they are of increasing nutritional value in time of shortfalls in staples. For preparing and eating wild food a special knowledge is necessary to avoid poisoning or sickness (Huss-Ashmore and Johnston 1997). The dishes prepared from wild and famine food are the same as the ones from normal ingredients such as aceda and mulah. Most products are fermented to increase not only their nutritional value but to make them eatable. Some of the consumed wild food might be highly poisonous and need special preparation and treatment before eating. The preparation and the collection of famine food usually takes much more time then food preparation under normal conditions. The collection as well as the preparation is mainly done by the women. In urban centres or big villages it might be possible that some wild food and by-products are also sold in the market.

These famine and wild food can be for example aisen/ mukheit (*Boscia senegalensis*), watermelon seeds/ khujar (*Citrullus lanatus*), fenugreek/ hilba (*Trigonella foenum-graecum*), cassia/ kawal (*Cassia obtusifolia*), desert date/ lalob (*Balanites aegyptiaca*), Christ's thorn/ Nabag (*Ziziphus spina-christi*), African palm seeds/deleb (*Borassus aethiopum*), tamarind/

aradeib (*Tamarinddus indicus*), and several wild grasses and roots (cf. de Waal 1989: 132-136, Sukkary-Stolba 1993: 292). In crises people also consume by-products such as groundnut shells, watermelon shells, press cakes from oil production (sesame and groundnuts), insects (locust), and fermented products of animal origin like cow urine, bones, or blood.

10 Gender Relations and Its Relevance for Meal Security in Sudan

10.1 Gender Relations in Sudan

When examining the food habits and meal security of Sudan it is necessary to have a closer look at the gender relations. Worldwide women play an important part in the household meal security and sustaining of livelihood. The women's activities, their skills, and knowledge to grow, collect, and prepare food are essential to secure the livelihood of the family (Boserup 1982, Jacobson 1992, Jiggins 1994, Kevane 2004, Teherani-Krönner 1994, Wichterich 1998, United Nations 2003).

The gender relations in Sudan are diverse and dynamic. They often are the output of or stand in interaction with cultural, social, and political structures. Males and females have their certain positions, responsibilities, and opportunities concerning their socio-cultural environment and are able to influence and change it by their behaviour and activities. Ethnic, class, age, location, and the personal attitude have a great impact on the gender relations of public and household activities. In many areas of Sudan the role of the women is traditionally orientated within the household. Beck (1988) shows this in the example of the nomadic Kawahla tribe in Kordofan where the task of the women concentrates on activities connected to their tents, children, and livestock. By contrast the activities of the men take place in the public spheres, taking the livestock to the pasture, and appearing in the market or politics. This contrast between inner and outer activities is closely connected to the socio-cultural norms which appear in all spheres of the society. If women leave the house to make visits, they make it within the family or close neighbourhood[81] and maintain the social network of the family. The men spend as much time as possible with other men to maintain and extend their public contacts, to exchange information, to discuss politics, or for enjoyment. Even if the roles and spheres are very clear, women can still move around in public. Nevertheless, there are differences between tribes and lifestyles. Nomadic women can move very freely in public. However, a family increases its Islamic image if at least the married women do not appear and carry out work in public (Beck 1988). The division of labour and sticking to its socio-cultural norms is very important. It is not the case that the men despise the work of the women or the other way around. To carry out the task of the opposite gender is considered ridiculous as the border to the sphere of the other will be crossed. The entering of the opposite sphere is shameful and the borders of the spheres are strictly followed.

[81] Especially in rural areas neighbours are often relatives, too. Usually settlement or community can lead back on the same ancestors many generations ago.

Traditionally and also politically determined men and women have specific tasks which follow a clear division of labour. There might be similarities but also variations from region to region or even within communities depending on the age, ethic, and social strata. Hence, it is almost impossible to generalise the gender specific tasks for the whole Sudan. Still, roughly it can be said that the monotonous and daily repeated tasks in the household are done by women and the bulky and short time tasks are done by men (cf. Grawert 1998: 103).

Apart from traditional gender relation the Islamisation since 1983 has had a serious impact on the lifestyle, especially that of women (Schultz 2005). Following the Islamists ideology and the idea of creating an Islamic nation the task of the women is to take care of the household and leave the outside work to men. In that context the woman is seen as caretaking mother and wife and as the custodian of the culture and morality. At the same time women are seen as immoral and have to be guarded and guided by men (Hale 1997). Nevertheless, the women are essential to build up the Islamic nation. The education policies offer higher education opportunities and employment in the formal sector to women. Many young women are taking part in the public life and are working outside the house but their sphere of activities in public is limited and under many restrictions (dressing and behaviour). Politically, it is preferred that women stay home and do not work outside the house if not necessary (Beck 1998, Hale 1997, Hesse 2002, Nageeb 2004, Schultz 2005).

10.1.1 Resources and Entitlement Distribution

As the activities of men and women the access to entitlements has also to be understood in the context of social and cultural norms and the Islamisation process. The access to land, credit, income, production factors, and services is essential to sustain the livelihood of the household. Although women have equal access to land use, their rights to land ownership are very limited. Most of the land in Sudan is community land, owned by the government. Men and women have the same right to use the land and it is rented irrespective to gender. Only a few women have the economic resources which are necessary to rent and access land. Registered land is usually owned by the head of the household and according to traditions women often transfer their land to male household members (FAO 1994, Grawert 1998, Pottier 1999). Moreover, men usually own larger fields than women. This is because of the Islamic law whereupon women inherit only half of the men's land share.

Privatisation and the use of advanced technology to produce cash crops threaten the women's access to land and their subsistence production. The environmental degradation and exhaustion of soils reduces the availability of fertile land. Women's agricultural production is more and more edged out to marginal areas because the farmers have to extend their fields to receive the desired production. The degradation of the natural resources increases the women's work and endangers the food production as the productivity lowers and less water and fertile soil is available (Hale 1997). This also applies to small-scale farmers and pastoralists which are increasingly driven out of their traditional field and pasture by the extension of large-scale agriculture.

Rural women lack collaterals because of their limited production capacity and land ownership. This restricts their access to credits. However, this also occurs to male subsistence farmers in the traditional agriculture or pastoralists. Formal bank credits are mainly given to large-scale farmers in the mechanised subsector or tenants in irrigated agriculture which are mainly male enterprises. The access to agricultural extension services also depends more on the agricultural production system than on gender. Services are mainly provided to cash crop production which culturally and politically is a male domain (FAO 1994, Grawert 1998).

The access to an income is essential for the survival of rural and urban households. Women trading on urban or village markets have a long history in Sudan. The process of Islamisation impedes the income generating activities of women in public spaces tremendously. This does not only interfere with the women's opportunities on decision-making and bargaining power but it also endangers the livelihood of households which depend on that income. Since Islamisation special political campaigns against market women had been carried out (Hale 1997, Nageeb 2004, Schultz 2005). For example, in western Sudan beer brewing and beer selling women were oppressed by the prohibition of beer brewing and alcohol consumption which drove many women out of public activities (Beck 1998, Hesse 2002, Schultz 2005).

10.1.2 Economic Activities and Labour Force

In Sudan rural women carry out the main part of unpaid agricultural activities and bear almost the entire burden of household work. Rural women can be seen as the main agricultural producer for the families' food supply as they cultivate their own plots and do unpaid labour in their husbands' fields. The women's activities and responsibilities vary from region to region. Most of the rural women in western Sudan do the agricultural work. They have their own cultivated land and sow, weed, harvest, and market their own crop surplus (FAO 2003b). Usually they grow food and cash crops to sell them in the market, have full control over the marketing, and the earned money. In northern Sudan only a small number of women own land. Most of the land belongs to men and women's agricultural activities are limited to their husbands' fields (FAO 2003b). In the East women's participation in agriculture is even lower. This is due to the agricultural production system which is dominated by pastoralism (FAO 2003b). The women are involved in the animal breeding system. Some communities also have a mixed production system and cultivate land. In that case the women may not own the land but are in charge of the food production. In Central Sudan, especially in the irrigation scheme, the women's responsibility in agriculture is very low as the land is mainly used for cash crops. Even if a small numbers of women are tenants[82], most of the women work on their husbands'

[82] It is very unusual to find female tenants. Their land is often smaller than the tenancy of men. Even if women might inherit their land, many male tenants receive their land directly from the government. It is quite common that women do not inherit land in irrigated schemes as the regulations of the scheme prohibit the dividing of tenancies. In that case it is preferred to inherit the land to a son (Bernal 1988). The distance of the plot to the house also affects the activities of women and the use of family labour. Female tenants or family members might do farming on the tenancy when it is nearby the house, but will often reduce their agricultural activities when the plots are further away (Bernal 1988).

plots unpaid (Bernal 1988) and many women especially from the west are seasonally hired (FAO 2003b).

Paid labour for men and women mainly exists in agricultural schemes and towns. Due to the process of Islamisation the participation of women in agricultural schemes (irrigated and mechanised) decreased (Grawert 1998). This mainly applies to middle-class women in northern and Central Sudan in the Nile Valley. By contrast female migrants from the west, regional girls, or older women of poor families are hired in the agricultural schemes (Grawert 1998) as their households often depend on an additional income.

The suppression of the rural women into the household away from paid work has a tremendous impact on the livelihood of the women and their families. In farming as well as in nomadic communities the marginalisation of the women can lead to the women's loss of control over the food supply of the family. Depending on the cash income and decisions of the husband the influence, decision-making, and bargaining position of the women declines (Grawert 1998, Hale 1997).

In towns, depending on age and social strata, many women and girls pursue an income earning activity. In poor urban households it is common for girls and women to work in public, mainly in the informal sector, to contribute to the family's income. In urban middle and upper class households it is more likely that women do not work in public as soon as they are married or become mothers (Hale 1997). This is mainly due to the Islamic ideology (not religious but political) which edges women out of the public sphere and limits them into the role of the caring mothers and wives. Still, the female working force of the urban middle and upper class is rising, mainly in the formal and official sector. This is due to the increasing number of girls and young women with higher education (Hale 1997, Schultz 2004). Economic participation of women is of high importance in so far, as it makes women independent from the male income and gives them more possibilities to make decisions. Still, many women just work to help their families financially and would prefer to stop working as soon as their income is not needed (cf. Hale 1997: 119).

The ratio of the estimated female to male earned income is 0.32. Even if the law guarantees equal wages for male and female (cf. Hale 1997: 105) in the same job the wages differ significantly (cf. Hale 1997: 114). This is also supported by the fact that men are more likely to work in better-paid jobs than women are. Less than 25 per cent of the female population are economically active (paid labour) compared to more than 55 per cent of the male population. About 30 per cent of the total paid labour force are women. More than 70 per cent of the employed women work in the agricultural sector. However, extracting the agricultural sector women make up less than 38 per cent of the agricultural paid labour force. About 41 per cent of the economically active population works in non-agricultural jobs. In that sector the gender gap is even bigger with less than 20 per cent of women working in that sector (Hale 1997, FAOStat 2006).

10.1.3 Political Activities

About 3 per cent of the members in the parliament are female (UNDP 2005) with 5 of 76 Ministers (UNIFEM 2005). The participation of women in politics is quite low. Especially in Islamic ideology it is unacceptable for a woman to appear in front of a public audience. Still, there is a very strong and active women's movement which fights for the political and economic rights of the women. Women's social influence is strongest at household level, which offers them chances of social and economic support (Grawert 1998, Hale 1997). Traditionally elderly women are allowed to speak in public and are usually highly respected by men for their political statements. The same applies to their position in the household where they play an important role in decision-making and giving advice (Grawert 1998, Hale 1997).

10.1.4 Education

In public life and education clear female-male gaps can be found. The literacy rate of women in the age group above 15 years is 50.5 per cent whereas the male is 71.8 per cent (CIA 2005, UNDP 2005). It is very likely that this gap widens with rural-urban, regional and class differences because of infrastructural distinctions and different daily activities and lifestyles. The gender differences in education are often deeply rooted in the gender-specific division of labour. Especially in rural areas where schools are not easy to reach and female livelihood activities are very time consuming girls are more likely to leave the school at a younger age. As soon as labour or income shortage appears they will stay home and assist in the household. Families tend to invest more into boy's education because they are expected to contribute to the family's monetary income in the future (Grawert 1998). But there is not only a gender gap but also a strata gap as education gets more expensive with the increasing level of education.

10.2 Gender Relations in Household Meal Security

10.2.1 Food Supply and Income Generation

In the household women and men, girls and boys have different responsibilities for the production, purchase, and preparation of food according the socio-cultural environment. In rural Sudan women are often the main food producers of the households. Through subsistence production and husbandry of small animals they guarantee a major share of the households food supply (Grawert 1998, Koch Laier et al. 1996). They also grow cash crops (groundnuts, sesame, roselle) or sell animal products (dairy products, eggs). The agricultural production of the men is also highly important as they provide the staple. Moreover, they often also provide the major bulk of the family's income by selling surplus grains, cash crops, or livestock but nevertheless, the women contribute to it by their unpaid labour (Beck 1988, Bernal 1988, Grawert 1998). It is the men's responsibility to provide and finance the food and living expenses of the household. If the women need something from the male sphere, the men will supply it by producing it or purchasing and exchanging the products on the market. Generally, the plots of the women are smaller than the ones of men. However, the diversity of plants grown is bigger on the women's plots, because women tend to provide the family with a variety of staple crops

and secondary crops such as vegetables, legumes, and fruit (Dey 1984). Additional to the subsistence food production women and men might generate an income from petty trading, services, or wage labour.

Even if women take care of their own crops and livestock it is very likely that they also provide unpaid labour at their husbands' fields. This does not only mean an additional workload for the women. They are also a guarantor for a successful harvest in the male agriculture which supplies the staple food and income of the household. Nevertheless, in traditional systems women and men have complementary roles in the food production of the household. With the withdrawal of one of them from food production the workload of the other increases tremendously. The major reasons for the male withdrawal from the subsistence farming are men changing to cash crop production[83] or male out-migration to agricultural schemes, urban centres, or abroad (Dey 1984, Myers et al. 1995a).

Women and girls are responsible for the entire housework. They have to collect fuel and wood, provide water, clean the house, prepare the food, rear the children, and take care of elderly and ill household members. As soon as the children, especially the girls, are big enough they take over duties from their mother (taking care of younger children, collecting wood and water). It is very common for girls in rural areas to leave school at a young age and support the family/ mothers with their labour force. In times of shortage (transitory or chronic) women spend even more time on food producing/ collecting or income generating activities which also raises the burden on girls who have to take over more tasks in the household (Koch Laier et al. 1996, Myers and Hamid 1994).

> "Women are exclusively responsible for child-care, food preparation, cooking and cleaning of the house and compound. […] this work is in addition to their work in the fields, and their care of small stock. Most women therefore rely heavily on their daughters, particularly for child-care. Fuel and water collection is also mainly a women's task […]." (Myers and Hamid 1994: 61)

In urban households the major share of the food is purchased. An income is needed which, depending on the strata, is generated by men and women. Traditionally, it is the duty of the husband to provide an income for food, clothes, education, housing, health service, and other livelihood needs (Nageeb 2001, Hale 1997, Schultz 2005). Nevertheless, especially in poor households women are working to earn money which is essential for sustaining the household's livelihood. But as described above also women of the urban middle and upper class are working in the public sector. This might not be because of economic reasons but because of their choice to be financially independent, make their own decisions (about their money and their lives) and take to part in the development of the country (Nageeb 2001, Hale 1997). No matter which strata women belong to, it is their responsibility to take care of the housework, the food preparation, and the child rearing.

[83] Here also the women contributes with unpaid labour.

10.2.2 Meal Security by the Transformation of Food Into a Meal

Even if the household food production or income generation is of high importance for meal security the latter will not be reached without the means to prepare a meal from the produced or bought products. Agricultural products or bought foodstuff must be transformed into a dish before it can be eaten. It is not enough to cover the calorie demand and food needs through the raw foodstuff. Raw products often get only digestible and eatable when their consistency, content, and nutrient composition is changed through preparation and transformed into a cultural accepted dish.

Methods, technologies, characteristics, and the kind of the prepared dish are very closely linked to the resources, traditions, social relations, norms, believes, preferences, skills, and knowledge of the household. The processing and preparation of food is often ignored since it is part of the female everyday tasks and not obvious to the public view (Teherani-Krönner 1999). However, looking closely at it will make clear that the preparation of a dish is one of the most important procedures in the long chain of socio-cultural processes to reach meal security. Producing, collecting, or buying the food product and the resources for the food preparation (fuel, water, processing and preparation implements and utilities) are just some steps in the cycle of meal. All foodstuff needs to be processed and prepared before eating (cf. Teherani-Krönner 1999: 209). Even if a household is rich and has all the possibilities to produce or buy the food its members' desire, it cannot be eaten before it is prepared according to the existing socio-cultural norms.

In Sudan the processing and preparation of food is exclusively done by women and girls (Beck 1988, Myers and David 1995b). These procedures demand knowledge of the ingredients, the nutritional value, the preparation methods, and the right recipe to prepare the desired dish in the desired taste, texture, and appearance. Moreover, the processing and preparation of food demand for the necessary skills and technologies. To prepare a dish is part of the women’s power. Even if the men supply or buy the food and provide the material facilities, they will depend on the ability and motivation of the women who prepare the meal. As soon as the man passes the food products to the woman it is in her possession. From that point on she alone controls the food and decides what will happen to it. The women decide and are responsible for what they make out of the available resources, what the family will eat, how it will taste, if it will be sufficient in its amount and nutrients, and if it will go along with the socio-cultural framework.

However, not only the women’s activities of meal preparation secure the meal security of the household. Women are the ones who maintain the knowledge of the food. This includes the nutritional knowledge and health aspects about the raw products as well as the knowledge about certain processing and preparation methods and their effects on the food. This knowledge might not be highly scientific and the women may not know which nutrients, ingredients, or substances are responsible to make food healthy, nutritious, or digestible. But years of experience and the passing on of knowledge over generations from mother to daughter makes women knowledgeable how a dish will affect the body and soul. Moreover, meal preparation

is loaded with norms, symbols, and emotion. The knowledge and skills to prepare food are a cultural heritage which is maintained by the women through their cooking and passing to their daughters.

This knowledge is even more important in crises. As mentioned above it is common in Sudan to eat wild food during periods of shortage. The women are the ones who collect the wild food and know which can be eaten or how they have to prepare it to make them edible. It seems that women have greater entitlements to common property resources in terms of gathered products since they have the knowledge how to use them.

11 Empirical Approach on the Food Habits in El Obeid

11.1 Objectives of the Case Study

Food crises, hunger, and famine are often associated with rural poverty and neglect. Today urban poverty is increasing at alarming rates. The rural food supply systems in Sudan with its characteristics and constraints have been object of many researches but hardly anything is known about the food system in urban centres. While in rural areas people secure their livelihood by farm and off-farm activities and rely, at least to some extent, on subsistence farming urban people mainly depend on income generation to cover their living expenses. For the urban poor that means, in terms of food, mainly low-cost starchy food and deficient in basic nutrients. As more and more people move into urban areas this research focuses on the food situation of a town: El Obeid. The different environment and lifestyle in urban areas lead not only to new opportunities but also to challenges and problem for the urban dweller. The case of El Obeid intends to provide the understanding of the food system and food patterns on the household level in urban centres. The food patterns are in a permanent process of changing through the interaction with natural, economic, political, social, cultural, and ideological factors. Especially, in urban areas the dynamics are increased by the high rate of mobility, exchange, and communication.

The previous chapters made clear that there is a close connection between the food supply situation and natural, socio-economic, political, and cultural influences. The food supply in its natural and socio-economic environment plays an important role for the household's meal security. The case of El Obeid will show that this alone cannot guarantee a sufficient diet. At least as important is the procedure of preparing and eating the meal. The meal security of an individual is not reached when the market supply is sufficient or the household has produced/ bought enough food. Meal security is reached when a prepared meal has been eaten. This not only underlies the importance of socio-cultural influences but also the significance of individual behaviour, preferences, and perception within the socio-cultural settings.

The study aims to examine the present food habits and its dynamics on the household level in El Obeid. The findings are going to be reflected on the food situation with its trends, problems, and perspectives for the meal security of the urban household. As the food habits are not static special attention will be paid to the dynamics of the food habits by examining the changes that occur. During the whole research the food habits are understood as a complex

procedure with the food supply, the preparation of a meal, and the consumption of the meal embedded in the interactions with the web of socio-cultural elements. Following questions are going to be answered:

a) What are the present food habits in El Obeid? Which factors have a crucial impact and how do they interact with the food habits?

b) What are the dynamics of the food habits in El Obeid? Which changes do occur and how are they caused? (Even if these changes might be caused by several socio-cultural influences the motivation of the individual will play also an important part.)

c) What do the present food habits and its dynamics mean for the food situation in El Obeid and how do they affect the diet, hence, meal security of the urban household and individual?

d) How does the individual judge the own food habits? (The perception of the individual is significant for the research since the own perception might express a different point of view than those obvious to the outside.)

11.2 Methods and Access to the Field

11.2.1 Selection of the Methods

To perceive a holistic picture of the food habits in El Obeid and to understand the complexity of the food culture and its dynamics a qualitative approach was selected. Qualitative methods allow a close contact to the object/ subject of research which is very important when examining social and cultural topics as well as the behaviour and actions of human beings (Strauss 1994). Especially in cases of hardly examined research problems, unknown research fields or cultures, and when the research focuses on personal experiences and perceptions qualitative methods are appropriate (Oswald 1997, Strauss and Corbin 1996). The researcher does not enter the research field (not only the locality but also the whole subject of research) with an objective perspective but as a subjective being. The background and context knowledge of the researcher (including specialist knowledge as well as personal experiences) should not be faded out during the research process as they are valuable capacities to collect and analyse data, to draw comparisons, and to discover variations (Elwert 2003, Strauss 1994) with the aim of reaching a complex and holistic understanding of the research problem.

The empirical part of this research is conducted in form of case studies and it aims for a holistic and in-depth examination of the research phenomenon. As the research focuses on actions, behaviour, and interaction of human beings participant observation was selected as the main method (Bernard 1995, Jorgensen 1989). In this special case participant observation is very suitable as it allows different forms of data collection. Apart from participant observation itself it can include methods such as natural conversations, semi-structured, informal, and in-depth interviews, taking of pictures, or mapping (Bernard 1995, Hauser-Schäublin 2003, Jorgensen 1989). The methodological flexibility also gives the researcher the possibility to adjust his actions to the situation and the immediate settings (Flick 1998, Jorgensen 1989). Additionally, cross-perspective proceeding (cf. Elwert 2003), hence the examination of the

same subject matter from the perspective of different interactions and different actors supports the acquisition of information about knowledge social contexts (Elwert 2003).

The phenomenon of food culture is characterised by its complexity and dynamics which cannot be discovered by static methods therefore an semi-structured approach seemed most suitable. During research and the process of observation the situations may change at any moment. Semi-structured participant observation as an open-ended and flexible process gives the flexibility to consider unexpected events at every time and adjust further actions to it. Following a guideline instead of a structured plan of research guarantees the flexibility and openness of the research (Atteslander 1985, 2000). However, this also means that the research and the research process is permanently a subject to redefinition and feedback caused by experiences and observation (Atteslander 2000, Jorgensen 1989). Through participant observation it is possible to realise, understand, and describe procedures, efforts, skills[84], events, actions, and interactions which lead to the understanding of social and cultural processes, contexts, and interactions. As the researcher approaches the field by joining the daily life participant observation makes it possible to study processes, social organisation, relationships, and interactions between people from the perspective of the participants respectively from the inner perspective of the observed subjects (Flick 1998, Hauser-Schäublin 2003, Jorgensen 1989). Apart from that participant observation allows the researcher to explore the phenomenon within the immediate setting and context of daily living situations (ct. Jorgensen 1989: 13). The involvement in the daily life of the observed people can cause mistrust and changing behaviour. But when people get used to the presence of the observer they might go back to their usual business and are often even willing to give intimate information (Atteslander 1985, 2000, Bernard 1995). Nonetheless, it can be assumed that the behaviour changes and the daily routine will be different in the presence of a stranger (Elwert 2003). Involvement in everyday life, understanding the cultural characteristics and the meaning of interactions and behaviour, and building up a trustworthy relationship make the researcher more sensitive to his environment and give him the opportunity to adjust his own behaviour and communication to the situation and avoiding embarrassing situation for both sides (cf. Bernard 1995: 141).

The method of participant observation also has constraints and limitations. Only situations can be observed that happen at the moment the observation is conducted. Some actions and behaviours, which can be relevant for the research, might never be observed. Moreover, if the researcher misses an action it usually is not repeated in the same way. These problems can be reduced through a high awareness and sensitivity to research relevant actions as well as making use of other kinds of data collection (Atteslander 2000, Flick 1998). For example, interviews can narrow this gap of knowledge and reconstruct actions and behaviour which have not been observed.

Another problem might be a selective perception of the observer. The observer can always only grasp parts of the events happening during the observation (influenced by his knowledge,

[84] Listening to the explanation how to bake kisra or watching a woman making it, the process seems quite easy. Only trying it out, it becomes obvious which efforts and skills are needed to produce a proper sheet of kisra.

experiences, and attitude). That way important processes and contexts might be missed or not be recognised. It might also occur that the meaning of an action or certain behaviour is judged and understood differently by the observer than its meaning for the acting person (because of different background knowledge or culture) (Atteslander 2000). The risk of misinterpretation by the observer can be reduced through the approach of the inner perspective of the observed people[85].

To understand the behaviour of others the researcher has to make the perspective of the other actors his own; he has to accommodate the perspective of the observed people. As the perspectives of the society members are not homogenous, it is necessary to realise and examine the variety of perspectives of different actors. Elwert (2003) suggests cross-perspective proceedings which include the diversity of perspectives of different informants in different situations, behaviour, and frameworks as well as using different media. However, the examination of different perspectives is not identical with the view of the subjects of research, as a foreigner (even reflecting numerous perspectives) the researcher realises the situation and behaviour differently according to his own individual background (Elwert 2003).

11.2.2 The Role of the Participant Observer

The degree of participation and entering the field brings up the discussion of how much the researcher should get involved or keep distance to the phenomenon. When doing participant observation the researcher has to become directly involved as a participant in the everyday life of his observation subjects (Atteslander 2000, Bernard 1995, Flick 1998, Hauser-Schäublin 2003, Jorgensen 1989). The participation will give the researcher access to the inner perspective and enable him to observe, experience, and understand the meanings of behaviour and interactions of people (cf. Jorgensen 1989: 20-22). The observations and the experiences the researcher will make depend largely on the degree of involvement into the field. People are usually much more willing to act 'normal', to give confidential information, or show feelings to someone they know and trust and who has to some extent become an insider. For a successful research with accurate finding the researcher has to find the best way between getting involved and keeping distance as well as between participation and observation (Flick 1998, Jorgensen 1989). This can actually be difficult as participation requires involvement while observation requires distance (Hauser-Schäublin 2003). On one hand social and physical distance to the field can lead to misunderstanding and inaccurate observation (cf. Jorgensen 1989: 56). If on the other hand the researcher participates on a higher degree, he might not be able to observe the field anymore and subjective involvement threatens his objective judgement (cf. Jorgensen 1989: 55). Still, participation reduces the possibility of misunderstanding and inaccurate observation as the researcher has access to what people do, think, and feel (cf. Jorgensen 1989: 56). People will more likely follow their business as usual

[85] Nonetheless, the researcher has to be aware of the fact that he will never be able to understand the meaning of actions and behaviours completely. He might enter the inner perspective but he perceives it from his point of view which is formed by his own individual background, attitude, and worldview.

and give the researcher access to their socio-cultural setting if he is involved in the community and behaves in a way that will not disturbed the people. The relationship between the researcher and the people in the field can have a strong impact on the quality of the information. Therefore, the researcher has to maintain the social relationships once accessed the field (cf. Jorgensen 1989: 21). The ascribed role of the researcher within the society of his research field determines the quality and kind of information he will get (Elwert 2003). The researcher might have more freedom in his behaviour outside given norms as he is a foreigner. This may give him access to spheres and information he would not get as an 'insider', but it might also limit his access. Integrated behaviour in the given society and culture might lead to a higher trust in the researcher. But it also can also cause further claims and expectations in his behaviour and integration which may restricts his access to certain parts of the society and information. The researcher will be ascribed to one role or the other and it is very likely that this role is not confirm with his self-image or where he would like to place himself in the society (Elwert 2003). While an acceptance of this role eases the access to the society and collection of information, a rejection could lead to serious conflicts and denial of information and access.

Nevertheless, this does not mean to give up the outsider role completely as the method also includes observation. An outsider can have a higher awareness of actions, behaviour, relationships, procedures, and events as he has a greater distance to the scene (Elwert 2003, Hauser-Schäublin 2003, Jorgensen 1989). This also applies to the researchers own background, experiences, and attitudes. They are necessary to recognise and compare certain behaviour, actions, processes, and events, but the researcher has to be aware of them to keep a certain degree of objectivity. He has to be aware of whether he has "seen what he wanted to see or what is really out there" (Bernard 1995: 152). Once becoming too familiar with the settings he might not recognise certain characteristics of the setting anymore and will not be able to judge them critically.

11.2.3 Carrying Out the Empirical Research

Selection of the Research Area

The site El Obeid was selected as research area for several reasons. Firstly, El Obeid is located in the middle of North Kordofan, an area very vulnerable to droughts and food crises. The region is characterised by harsh climate and living conditions. The majority of the rural population of North Kordofan lives on subsistence rainfed agriculture. Many people live in poverty and are vulnerable to food shortage, famine, and destitution. Secondly, El Obeid is the most important town in the region of Kordofan and is therefore most suitable for research on urban meal security issues. Furthermore, doing research in this remote and vulnerable area gave a good opportunity to examine the impacts of the national economy and the agricultural and food policies of the central government. Also, the remoteness and harsh conditions of the surrounding region lead to a very strong trend of urban migration. Many rural people migrate to El Obeid, temporary or permanently, in the hope of finding better living conditions. This leads to high dynamics in the town with changing structures within the households and public life. Thirdly, El Obeid is one of the most important trade centres and places of economic and

cultural interaction in Sudan. It has a long tradition of animal and cash crop trade and has always been an important meeting point for travellers from all four corners of Sudan and Africa. Fourthly, in spite of all this El Obeid is a location where many Sudanese traditions are still alive. But the influence of the modern western way of life is already very present. The longing for a comfortable way of life in western style on one side and the high awareness and consciousness of the cultural background, traditions, and norms on the other side create an interesting cultural mixture. This gives good opportunities to realise the dynamics and changes of daily life.

Secondary Data Collection

The information about the agro-economic, socio-economic, and political situation of North Kordofan and El Obeid is based on secondary data from surveys of the local government, NGOs, literature about Sudan and western Sudan, and informal expert interviews. Hardly any specific secondary data concerning food habits in general and especially about food habits in El Obeid is available. The existing data mainly focuses on the agricultural production of North Kordofan, the situation of agricultural markets, and the nutritional status of some locations of rural North Kordofan. Most of the already rare literature on food habits and food security concentrates on the rural areas. It hardly gives any information about the food culture, perceptions, and preferences of the individual. For a differentiated view of the food situation and the socio-cultural context of the region sociologic and anthropologic literature and essays have been very important sources as it is necessary to understand and substantiate that the socio-cultural structures have a major impact on the behaviour of individuals.

Carrying Out Empirical Research

In February 2005 I have travelled to El Obeid where I stayed for 10 weeks. From previous visits to Sudan (Khartoum/ Omdurman) I already had a basic knowledge of Sudanese cultures and traditions. This proved to be an advantage not only for my own integration into the culture. It also eased access to people and my involvement in communities when they found out about my ‘Sudanese’ experiences. Like during all my previous visits I lived with Sudanese. On one hand this made it easier to get into contact with locals. On the other hand it also helped to learn as much as possible about their culture by diving into their daily life and being involved in their activities and lifestyle. I was fully aware of the ‘danger’ of ‘going native’ by getting involved in the local way of life. I also was conscious of my own socio-cultural background, my background knowledge, and my experience which on one hand created some kind of distance to the life I was involved in. On the other hand this consciousness made it impossible to be objective and to fade out feelings and attitudes completely. Actually the involvement and the partial integration were necessary not to stay the outsider with no insight in the inner perspective but becoming the outsider being to some degree involved in the inner perspective. Only this way I could get an idea of social processes, organisation, relationships, and interactions between people. Being involved allowed me to observe actions, behaviour, and events within the setting and the context of daily life situations and gave me the possibility to understand cultural characteristics and the meaning of interactions and behaviour.

By not denying my points of view and emotions I wanted to have a most natural and honest relationship with my opposites, who generously gave me access to their daily life, private spheres, and thoughts. For me it was important to minimise the distance between me and the people and to show that it was me who wanted to learn from them. I wanted the people I talked to and the households I visited to realise that I was interested in them, their way of life, point of view, and emotions and not just in data. Since I wanted to learn most intimate things about the visited households, I had to open up myself otherwise it would have created an unfair inter-human barrier and a dishonest and unbalanced relationship. Within a trustworthy relationship people were not only willing to give information about their life; it also made me more sensitive to my new cultural and social environment.

My research in El Obeid can be structured in three categories. One part was to make interviews with 15 key informants from different institutions such as the local government, the university, and NGOs working in North Kordofan. Moreover, I talked to many people of different professional and cultural backgrounds to gather as much general and problem specific information about El Obeid as possible. The second part was the observation of the market situation. This would help to get an impression of the food supply situation of El Obeid. The main part was to visit 10 households. I chose to collect information about their food patterns and to find out about the individual perception of the different household members by doing case studies.

As the households and group of interviewees were very heterogeneous flexibility of the research procedure was needed, so I chose semi-structured methods. Each piece of information I gained was regarded as provisional. Hence, in all stages of research I followed a checklist (Appendix 11) which was always reviewed and tailored to the results of the analysis of the earlier observations and interviews.

The research is not designed to be representative for the whole of El Obeid or Sudan. This would have taken a massive survey covering more households of all kinds of economic, social, cultural, ethnical, and local categories. Instead I concentrated on the depth of the analysis. The goal of the research was to show diversity instead of an average. Meal security cannot be reached through focusing only on results of average surveys but considering the food needs and desires of individuals is necessary as well.

For the interviews with the key informants I used open interviews since the interviewees came from different professions and backgrounds. Moreover, that way the interviewees could answer the questions freely without being bound to given alternatives[86]. The interviews focused on information about the food supply situation of El Obeid and North Kordofan in the context of the political and socio-economic framework. It has to be mentioned that it is not easy to get reliable official information and data about the present food supply under the current political

[86] Standardised interviews might be easier to analyse but if the possible answer is not enclosed in the alternative answers the person asked might not be able to answer or might choose the alternative answer closest to his point of view. Therefore standardised interview might not reflect the true position of the interviewees but the ones which are most likely accepted (cf. Streiffeler 1993: 27).

circumstances in Sudan. Several times institutions (even international organisations) rejected cooperation and information. All the more I am very thankful to those people who made big efforts to supply me with as much as reliable information as possible.

It was impossible to interview all fifteen people I had planned to. I had to realise that some could not be reached and others were not willing to cooperate or did not give relevant information. As the number of interviewees reduced significantly I decided not to enclose the results of these interviews. I used them to improve my knowledge about the political and economic situation regarding food security in Sudan. Moreover, several essays on agricultural and food policies exist which deal with the problem more in depth than I could have done it.

For the market observation I visited all main markets and additional several small markets and shops. Apart from having a good look at the market supply, I talked to many traders and shop owners about the supply situation and prices. Furthermore, I observed the customers and traders, their behaviour, and their relationships. Although this part will not be further analysed, the market observation not only gave an impression of the local food supply but also helped to understand relationships between the different actors, strata, generations, gender, and ethnic backgrounds in public spaces. Me, being a European, made my appearances on markets in El Obeid very obvious. Not many foreigners walk around in the streets. This made it quite easy to get in contact with people. Traders invited me for drinks and asked me to sit in their stalls and shops for a rest. El Obeid is a relatively small town and with only a few foreigners being present in public life I was well known after a short time. In the streets and on the markets people greeted me by my name. However, as markets are a very sensitive area it can be quite risky doing research there. Officials and some traders do not like curious foreigners. So while one trader might be willing to give information and help or have his picture taken another one might come running, accusing one of spying and of making bad reports about Sudan.

The main part of my research was the case studies of household visits. I used open and semi-structured participant observation, which included natural conversations, semi-structured open interviews, taking pictures, and drawing maps of the houses. The combination of methods proofed to be very helpful. Several times I was told one thing but could observe a different actual behaviour. The open character was important because transparent behaviour on my side increased the bond of trust between the household members and me. At the beginning of each observation I noticed a certain degree of mistrust and there seemed a slight change of behaviour. Nevertheless, after some time people got used to the situation and felt not disturbed any longer. From that point on the open observation even increased trust and familiarity between us which increased the amount of exchanged information.

I visited ten households of which six will be introduced here. It was impossible to carry out a random survey because there is no official data and systematic documentation of the town's residents like addresses, income, or profession. Moreover, due to the small number of households and the profound character of the research, the quality of the data gained was of main importance. I selected the households by geographical clusters in which El Obeid can be divided (Map 15). The first circle is the old town centre relatively close to the central market. This is the area where the majority of the families have lived for several generations. These

are mainly families of merchants, traders, and officials. The second circle is the area outside the central quarters. This area is occupied by families who are not originally from El Obeid but have lived there for some time, in many cases for the second or third generation already. These people may also work as traders, merchants, or officials but many of them are employees of the university (which is situated in that area), schools, or international organisations. The third circle is the outskirt of El Obeid. In this area a large number of part-time residents can be found. Also, many families who have recently come to El Obeid live there. Most of them are rural migrants or refugees from areas affected by the civil war. Of course in each circle exceptions occur but this division can be seen as a classification which applies to the majority of the residents in these areas. Apart from the geographic cluster I selected the households from different groups varying in class, profession, ethnic group, and household structure to vary the perspective within the society itself.

As I wanted to spend as much time as possible with the selected households and wanted to participate in their activities to gain an insight into their lives I had to select families who were actually willing to let me into their lives. Therefore, the selected households were mainly people I met through colleagues and friends. For a successful research I needed the cooperation of the households. Therefore, I planed my schedule and visits according to their suggestions. At least the first visit and longer visits I made appointment, while in many cases shorter visits could were made without any arrangement.

To some households I was accompanied by my two assistants. Since I planned to enter the female sphere of the households I chose two young female assistant teachers from the University of Kordofan. Both of them were from El Obeid and had a good knowledge of the location, traditions, norms, and spoke English. Apart from being my translators they also made contacts with households I could visit, arranged appointments, and were my guides around the town. As they were familiar with my research guideline and the objectives of my study they were sometimes drawing my attention to activities or special features I might not have recognised on my own. They also explained and discussed certain meanings of actions, procedures, and behaviour with me or sometimes pointed out my own behaviour.

Hardly speaking the local language (Arabic) myself was a slight disadvantage sometimes. Apart from having to rely on the accuracy and completeness of my assistants' translation people might also have told me different things if I had participated in their daily life on my own. Nonetheless, I realised that my inadequate Arabic was not an inter-human barrier. I even spent time with non-English speaking families on my own without any serious problems of communication. Also observing only people's gestures and behaviour contained a lot of information.

During the observation I took notes and pictures and drew maps of the property. Since the participant observation was semi-structured and often unplanned I could not record all conversations on tape. I preferred to take notes which made my intentions more transparent to my opposites. Sometimes they thought over their statement and added some more information while I was taking a short note. Sometimes I could observe changing behaviour when withdrawing from participation taking notes. Also taking notes sometimes gave me the possibility

to distance myself from the whole situation and to think over the role of the other actors and my own role and its influence in this particular setting. Moreover, creating distance also gave me the opportunity to revise the research process and adjust the next steps. Nevertheless, I always supported a communicative atmosphere to have an active exchange of information. This way I learned as much as possible about my opposite and it created a friendly and relaxed atmosphere. The interactive atmosphere did not always allow taking notes as it would have interrupted certain procedures. In these cases I wrote down only some key words or wrote memory protocols afterwards.

I usually spend at least one whole day doing participant observation. I went shopping with them, cooked with them, cleaned up, sat with them and their visitors to drink coffee, even took naps at their houses, and often ate with them. This way I could see and participate in most of their activities. This also included small talks with different family members. The other visits were usually for getting questions answered or just spending some more time with them. Most of the households I visited frequently. Some members of the households I also met outside their homes or visit them at work to get also an impression of their public life. This gave me a more complex picture.

As the dynamics of the food habits are an important part of the study I also aimed to investigate the past food habits of the families. Not only looking at the food patter, preferences, and behaviour of the different generations living within one household I also asked questions about the food habits and lifestyle of the previous generations to round up the picture and get an impression of the trends and dynamics.

A communicative, informative, and trustful atmosphere needs building up and maintaining social relationships. This includes spending a lot of time, literally hanging out with the people (cf. Bernard 1995:151), not pushing them for information but integrating in their way of life and showing respect towards their behaviour, thinking, and way of life. Therefore, getting access to families and doing participant observation included a lot of sitting and chatting with people, asking and being asked questions as well as joining their daily activities. The activities we did and the topics we talked about often had nothing to do with the actual topic of my research but nevertheless, gave me a lot of important information about the meaning of actions, behaviour, events, and about social structures and lifestyle. Of course I had to keep the actual aim of my research in mind. Pushing people for actions or statements would have led to inaccurate information and unnatural behaviour. In a trustworthy relationship, with people feeling comfortable they sometimes gave very intimate information, which would never show up in any report but which helped to get a more complex picture and to understand contexts of the behaviour and actions of my opposites.

The Sudanese are very hospitable. People are friendly to strangers and are very open and welcoming. As soon as you enter their house, sit down, and have a drink, they want you to stay for the rest of your life. Sudanese themselves say that they love strangers and have a very big sense of responsibility for them. This might be because they know that life in Sudan is not easy and they want to comfort foreigners. It is also because of their traditions and the Islamic rules to serve guests. It is very easy to get access to Sudanese people and their houses, espe-

cially for a European woman. My big advantage was that I had not only access to the sphere of the women but also to the spaces of men, not only in the household but also in public. It was a big advantage to be able to see all facets of the society. I sat and talked with the women as well as with the men – even when male guests were around. A privilege a Sudanese woman hardly has. Of course it would also be impossible for a European man to enter the private female sphere.

Even if the hospitality of the Sudanese is very comfortable, it can be a problem doing research in households. I have asked the household members in advance not to treat me too much as a guest but of course it mostly did not help. However, special treatment for me was also a reflection of the traditions and habits of treating a guest. Therefore, I preferred to be treated like a guest and not like a researcher, as the situation would have been much less relaxed. Moreover, recurred and sometimes unannounced visits and spending time with the families decreased my status of a special guest and reduced special treatment.

I also made the experience that people were much more open to me if I also gave them insight into my life. It was easy to create a familiar atmosphere when first talking about my life and family in Germany. Furthermore, me living with Sudanese in the Sudanese way reduced the distance. Many Sudanese think that foreigners from Europe and America in Sudan only live in the big houses in nice areas in the town and drive around in their big cars. They were surprised to find out that I lived with Sudanese, used the public transport, and shopped at the same markets as they did. This showed my respect towards their culture and way of life and made me, to some extent, one of them, still being a guest but definitely not a stranger.

Nevertheless, the results of this research are no replica of the investigated society as a whole but the result of a selective and subjective perception of me as the observer. An objective and neutral research is impossible as I as the researcher examined and was involved in a social community. On one hand I have my own personal social, cultural, and normative background which is impossible to fade out. This way information is judged under a certain point of view. However, the different background allowed me a differentiated and comparing reflection of the perception and findings (outsider perspective). On the other hand even as a stranger, non-belonger, guest, or integrated person I was placed into the social system, fit in a certain role which has to be respected and carried out to maintain interactions and relationships. Still, the results are outcomes of interactions between the observed people and me. They are part of the reality under these circumstances. Even though the presence of me as an observer influenced the actions, behaviour, and feelings of the observed I could still draw conclusions on the social procedures and structures of the society.

11.3 The Research Area

11.3.1 North Kordofan State

North Kordofan State (12°12’-16°40’ N; 27°-32°20’ E) located in Central Sudan covers an area of 185,300 sq. km (UN Sudan 2004) with about 1,554,000 residents (UN Sudan 2004, WFP 2004a). About 65 to 70 per cent of the population live in the rural area (UN Sudan 2004). The ethnic structure is very heterogeneous.

North Kordofan lies within semi-arid climate. It has desert climate with high temperature fluctuations between day and night which are strongest in the winter months (November to February) (Beck 1988). The relief is dominated by sandy soils (goz sands) and the landscape is characterised by semi-desert in the north and woodland savannah southwards (Haaland 1991, UN Sudan 2004). The goz sands have a low mineral and nutrition content and a deficiency of organic matter. Their capacity of water holding is very low (El-Dukheri 1997, Hashim 1995, Mahmoud 2001). The annual rainfall in North Kordofan ranges between 250 and 400 mm. The rainy season is from June to September (Beck 1988, Mahmoud 2001, March 1948, UN Sudan 2004). The rains in North Kordofan are very erratic. Declining rainfall, overgrazing, over-cultivating and deforestation make this region very vulnerable to drought.

North Kordofan State is divided into five provinces (Sodari, Bara, Sheikhan, Gebret el Sheikh and Um Ruwaba) and 17 administrative units (Mahmoud 2001, UN Sudan 2004, WFP 2004a). The technical infrastructure of North Kordofan State is weak. The road system is dominated by dirt roads. Only the roads from Kosti (Khartoum) to El Obeid, El Obeid to Khuwei, El Obeid to Kazgail, and El Obeid to Bara are paved. The railway line goes from Khartoum via Kosti, El Obeid to Nyala (UN Sudan 2004). It is very old and only used for cargo. Trains go several times a week but they are very unreliable since the network and trains are very old and spare parts are lacking. There is one paved airport in El Obeid.

Electricity and piped water are only provided in urban centres. In rural areas water is provided by hafirs (rain collected) or public pumps and taps. It is estimated that 75 per cent of the population in Kordofan has no access to clean water and more than 48 per cent of the population have to travel more than 10 km to water sources (UN Sudan 2004). 14 hospitals are found in North Kordofan mainly in urban centres and bigger villages. Additionally, there are several health centres and primary health care units. North Kordofan has several primary and secondary schools and two universities in El Obeid (Kordofan University, El Quran el Karim University) (UN Sudan 2004).

The rural economic activities in North Kordofan are dominated by traditional agriculture. The farm management systems vary depending on the natural environment also reflecting different tribal cultures. Rural settled households make up the majority. They mainly follow small-scale rainfed farming and agro-pastoral activities. The agricultural products are almost exclusively produced in the traditional rainfed subsector. Millet, sorghum, sesame, groundnuts, watermelon, gum arabic, and roselle are the main crops and many households keep some livestock (El-Dukheri 1997, Haaland 1991, Hashim 1995, Hesse 2002, Maxwell 1991b, c, Myers et al. 1995a, UN Sudan 2004). Kordofan is the second most important producer of millet which is with favourable yields the main crop on the goz soils. It is mainly produced for subsistence (Appendix 4). Moreover, North Kordofan is one of the main production regions for groundnuts, roselle, and gum arabic which are almost exclusively produced in the traditional subsector. In general, the agricultural yields are very low (Appendix 4) which not only affects the subsistence but also the income opportunities. The low yield can be explained by the climatic conditions, the goz soil, deforestation, the exhaustion of the soil through overgrazing, and over-cultivation (Tully 1988). Furthermore, in the traditional subsector are hardly any

inputs like fertilizer or improved seeds as well as credits available (von Braun et al. 1998). Under the 'normal' harsh conditions many rural households are not self-sufficient. The diversification of production (food crops, cash crops, and livestock) and a combination of farm and off-farm activities is essential for the farmers' survival.

Especially in the northern parts the nomadic system is still very common (Beck 1988, 1998, El-Dukheri 1997, Haaland 1991, Hashim 1995, Maxwell 1991b, UN Sudan 2004). Traditionally, North Kordofan is the land of nomads. The dry climate makes agriculture especially the cultivation of millet and sorghum to a risky enterprise. Therefore, the areas are used by nomads who can move their husbandry to better pasture in case of failing rains. Because of the harsh environmental and economic conditions, and new social norms more and more pastoralists settled over the last decades (Beck 1988).

North Kordofan State is a poor region with a high rate of malnutrition (FAO 1995-2005: 18-23 per cent). The poor sanitary conditions and the insufficient supply of clean water worsen the situation and the vulnerability to infections and illness. The malaria incidents are very high with an infection rate of 53 per 1,000 people (UN Sudan 2004). The remoteness of the rural areas, the low agricultural productivity, the unavailability of production factors and credit, the poor economic situation, and the lack of income generating possibilities make life into a daily struggle of securing livelihood for many rural and urban households. If there are income generating opportunities, the wages are very low. The state itself is remote and has been politically and economically neglected for a long time. There has been very little technological, infrastructural, and economic change over the last few decades. The lifestyle and way of agricultural production of many rural people hardly differ from the one during British times (cf. Kevane and Stiansen 1998b: 1-45).

11.3.2 El Obeid

El Obeid (13°18' N; 30°21' E) is the capital of North Kordofan State. Little is known about the older history of El Obeid and Kordofan[87] compared to the Nile Valley. The town El Obeid was established in 1821. El Obeid is one of the most important trade centres and places of economic and cultural interaction in Sudan. It has a long tradition of trade and was always an important meeting point for travellers from all four corners of Sudan and Africa. For a long time El Obeid was the most important market place for trading slaves, ivory, camels, sheep, tamarind, and gum arabic[88] (Brehm 1975, Hesse 2002). Kordofan had been an important trade route for the passage from west to east since the 17th century. With the flourishing of El Obeid

[87] The area of Kordofan was a bone of contention between rules from the east and west for many centuries. In the early 1820s Kordofan as invaded by troops of Mohamed Ali. In 1881 the Mahdi and his fellows started the rebellion against the Turko-Egyptian government in Kordofan. In 1883 the Mahdi conquered Kordofan and Kordofan was acknowledged by the central government as an independent state with the Mahdi as its Sultan (March 1948, Theis 1999). Through the Mahdist strife in Kordofan many nomads lost their livestock which lead to an increased settlement end of the 19th century (Ibrahim 1984).

[88] El Obeid lies not only in the centre of Sudan but also in the centre of the so call gum belt where gum arabic (Acacia senegal) is grown, which stretches from East to West Sudan. Therefore up to date El Obeid sometimes is called the world capital of gum arabic.

and Bara the south-north route became of increasing importance (Hesse 2002). In 1912 El Obeid was connected to the railway which was the most important economic development for the town at this time.

Up to date El Obeid is one of the most important towns in Sudan. This is not only because of its central location which makes it a gateway to western Sudan and Africa. It also has an important function because of the agricultural production of Kordofan and Darfur, and the gum arabic production and trade which is associated with El Obeid internationally. Furthermore, the town is famous for being a central place for camel herders from the north and cattle herders from the south. They usually pass El Obeid within their seasonal movements and make it a livestock-trading place which is known for the high quality of livestock and even visited by international traders.

Nevertheless, it cannot be denied that El Obeid lies in a poor and remote region within a harsh natural and politically neglected environment. Even if the street life in the town centre is busy and the market supply is to be lush, a closer look and talking to the residents creates a different picture. Leaving the town centre gives a more realistic impression as it is quieter, the streets are not paved, and the markets and shops have a modest supply. The job opportunities are very limited. There is hardly any perspective for skilled and unskilled professions. The wages in all sectors are low. Even in official jobs people often wait for months until they get paid. There are not many opportunities for people's pleasure and the biggest highlights are the frequent football matches and weddings. Many people say that their life is tough and does not offer too many opportunities.

Today El Obeid with about 420,000 residents and an area of about 10 sq. km is the sixth biggest town in Sudan. About 300,000 people are permanent residents. About 12 per cent of the permanent residents are government employees, 6 per cent are market workers and merchants, 14 per cent industry workers, and 20 per cent work in the agricultural and agricultural related sector. 48 per cent of the population are in the groups of under aged, retired, and unemployed people. About 120,000 people are part time residents who are mainly rural people who come to the town to find work during the dry season or to sell agricultural products or handicraft. There are also nomads who might stay for some time when they pass the town[89]. Furthermore, El Obeid can be seen as the springboard to Khartoum. Many rural people who migrate from western Sudan or southern districts stop in El Obeid until they can afford to travel to Khartoum.

As the capital of North Kordofan State El Obeid accommodates the state government, administration, and judiciary institutions. El Obeid has several primary and secondary schools and two universities. There are one public and one military hospital and several private clinics and doctors in the town. The traffic infrastructure is relatively good but only the main roads are

[89] This data I gained from the Ministry of Agriculture of North Kordofan State. I received this data hand written without any information about the source or concrete explanations. It can be supposed that these numbers do not cover the informal sector and unregistered work. Hence, these number should be used carefully and give no guarantee for a true and reliable interpretation.

paved. Unpaved roads may be covered with thick desert sand which makes driving and walking adventurous. There is a public transport system with some buses serving the town and some going into the outskirt areas. Furthermore, there are several taxis and mini buses. For long distances travel several enterprises offer bus service to other towns. The communication network is very weak. Only a small number of household has a telephone connection. There are no public internet stores, and the television and radio reception is limited to a couple of channels if not using a satellite dish. Many people own a mobile phone but the network is weak and sometimes not working at all. The electrical and water supply only covers the inner districts of the town. There might be even households close to the old town centre which are not served with piped water. These households have to buy the water from small enterprises that regularly bring water to the houses. Power or water cuts appear several times a week. Therefore, many houses have barrels, underground basins, or water tanks with pumps to store water. In the outskirt public hand water pumps are found, but these are often broken. The water used to be provided by a rainwater reservoir near El Obeid and was pumped to the town. Today the piped water comes from Bara[90] and is treated in a modern water refinery just north of the city. The water quality of the Bara wells is high but the water is not treated and stored properly and many people complain about diarrhoea after cousuming uncooked water. Also, in some living quarters the water is stored in cisterns which are not locked properly, get easily contaminated, and are breeding places for mosquitoes.

The main market of El Obeid is right in the town centre. It is a net of several parallel and crossing lanes with many stalls. The main roads around the market are also occupied by many shops, workshops, pharmacies, and trader offices. This market offers everything one may need from food over cosmetics, clothes to spare parts for cars. Apart from the stalls and shops there are many small traders who may sell just a few items spread on an old piece of cloth or sugar bag lying in the sand. Apart from the central market, El Obeid has several other markets. There is one bigger market near the main station and one each in the east, the south, the west, and the north of the town. Furthermore, there is one vegetable and fruit market close to the town centre where products can only be bought in big quantities. Right in the city centre is the crop market which is an auction market where regional cash crops are sold. This market is one of the most important agricultural markets of central and western Sudan. Almost outside of the town is the livestock market which is also famous in the region. All over the town smaller markets and several shops can be found. The markets are usually in walking distance and accommodate a few grocery stores and some stalls where vegetables, fruit, bread, and meat are sold. Usually a small mill with a diesel engine can be found in the markets. The density of the shops decreases as one moves away from the town centre and the older living quarters. In the outskirt shops are much rarer and often have a poor supply of goods.

[90] There is one atypical area in North Kordofan around Bara (Khayran region) (about 60 km north of El Obeid). This area lies in a depression with shallow wells which makes irrigation by pumps or manual (*saqqiya, shaduf)* very easy. This area is well known for its excellent horticultural production of vegetables. Also various trees are found in this very green area.

Figure 14: Map of El Obeid showing the geographical cluster of the research (Administration of El Obeid, North Kordofan 1990; reworked by M. Röder)

Near the main station is the industrial area where uncountable small workshops, garages and factories have settled. El Obeid has many small oil mills producing mainly groundnut and sesame oil. There are also several small sweets factories and two pasta factories. El Obeid used to have two big flourmills but one stopped because the transport of grain and the milling were too expensive. Moreover, El Obeid has four big bakeries for bread with electrical or gas ovens. In many living quarters small 'traditional' bread bakeries can be found. Near the livestock market is a locally administered 'slaughterhouse'. It has no machines or modern facilities and the animals are traditionally slaughtered by hand.

Probably the most important industrial sector in El Obeid is the new crude oil refinery which refines 15,000 barrels per day. It does not only provide employment for qualified workers, but also leads to a higher supply and a better availability of petrol at a decreasing price in the region.

12 Household Eating Habits – Case Studies

12.1 Amna

House and Family

Amna and Osman[91] live in the quarter Ashlak, right in the town centre of El Obeid. Their house is almost opposite the crop market and around the corner of the central market. The street where Amna, Osman, and their children live is a typical sandy street with deep sand. Their property has a size of about 20x10 meters. The house is about 7x3 metres and made of bricks, plastered, and was painted long time ago. It only consists of two rooms. Next to the entrance of the property is the men's shelter (*ragoba*) which is furnished with three beds (*angereib*). The roof and walls of the men's shelter are made of straw mats. The women's shelter is located in the opposite corner of the yard. It also is made of straw mats and furnished with four beds and a small table in the corner. Next to the women's shelter is the kitchen. The kitchen is separated into two areas: a small mud house (2x2 m) and a small front yard (about 1.5x2 m) which is separated from the yard through a low mud wall. There are two toilets in the yard which are separated by a mud wall but have no roof. The toilets are just pit holes in the ground not connected to the sewage system. Furthermore, there is the bathroom - a small hut of about 1.5x1.5 meters. The water flows through a small hole in the bottom of the wall into the yard. The yard is separated through a wall which to some extent creates a male and female part. Because of the wall it is impossible to see the women's shelter from the men's shelter and the other way around. Apart from the sealed floor in the house and the kitchen the whole property is not sealed and the floor is pure sand.

The house is connected to the electricity and has one water tap in the yard. It is not connected to sewage. The water and electricity supply vary on the family income and the supply service.

[91] All the names of the people in the case studies have been changed to keep up their privacy and discretion.

In case of water and power cuts the family has two big barrels in the yard and in the women's shelter are two *zeers*[92]. Everybody has access to the barrels and zeers which contain water for drinking. The water quality of the tap water is very bad. Sometimes, if they have no water they get some from the neighbour. For that they have a long hose which they pass over the wall to the neighbour.

Amna is 48 and a housewife. Osman is 54 and works as a policeman. They have six children – three daughters and three sons. The oldest son is 25 and works also as a policeman in El Obeid. The second son is 23 and is a student in Khartoum where he lives with relatives. The oldest daughter is 20 and a student in Delling where she lives in a girl's student home. The second daughter is 17 and in secondary school, as the youngest daughter who is aged 15. The youngest son is 10 and goes to primary school. The three youngest children and the oldest son live at home. Amna's sister who normally lives in the West Kordofan with her husband also lives with the family. She was ill and came to El Obeid to stay with her sister. The family used to live in Delling where the father worked as a policeman. It is common that policemen are transferred to different areas from time to time. Therefore, the father was transferred to El Obeid about ten years ago.

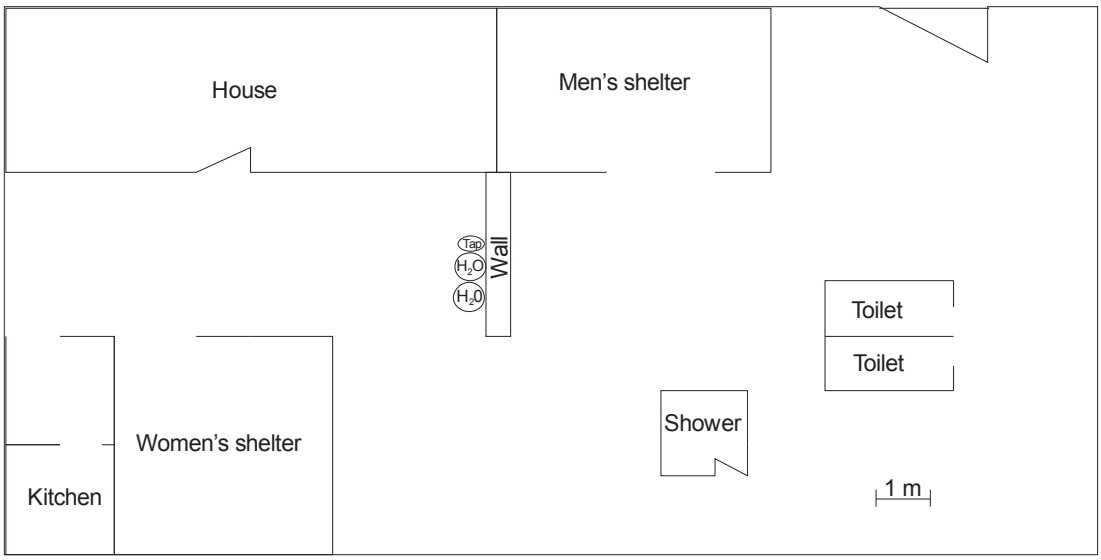

Figure 15: Property of Amna's family

Food Supply and Kitchen

As already mentioned the kitchen is very small and there is not much space. In the little front yard of the kitchen are an old bed without a mattress and one old chair to sit on. The bed is usually used as table to put dishes, pots, and ingredients on it. In one corner of the front yard is the fireplace where kisra is made. The house part of the kitchen is two steps up. It is not on

[92] A zeer is a traditional water storage facility. It is made of clay and burned without coating. That way the water enters the clay and through evaporation the water in the zeer is cooled and keeps fresh. The zeer also somehow cleans the water and particles settle at the bottom.

ground level and has a sealed floor. Though very small it is well equipped with different sized pots, pans, storage containers, bowls, and dishes. There is a three-flame gas stove[93], and also three traditional charcoal ovens (*kanon*). It can be said that the family owns all the basic utensils for a well-equipped kitchen. They also have a small electric blender. The equipment might be simple and rather old but the family has the opportunity to prepare meals in a proper way. They also have numerous dishes to serve visitors. In the house they have the cabinet for the dishes for special occasions[94]. They also keep the big and shiny pots for special occasions in the house. The family has no refrigerator or deep freezer.

Osman's income is the only one of the family which has to cover all livelihood expenses. So he pays for the food, rent, electricity, water, fuel, and also if new dishes or pots are needed. Even if the oldest son earns money, he keeps it for himself. As he plans to get married soon he will need it to pay for his wedding and bride. The food the family consumes comes mainly from the central market and the nearby grocery shop. The main shopping is mainly done by the father and sometimes by the oldest son. Smaller shopping is done by the youngest son and maybe - but more seldom - by the girls. They family mainly uses unprocessed products like vegetables, fruit, meat, rice, spices, coffee, and semi-processed food like flour from sorghum and wheat, pasta, sugar, and tea. The only further processed and ready-to-eat products are ful and bread. The family has no refrigerator and not much space to store food, and they cannot store fresh food longer than one day. The shopping is done almost every morning. Food that does not spoil easily like rice, pasta, and flour is stored in closed buckets and containers in the kitchen. There are also several containers with spices (salt, pepper, chilli, cumin) and other ingredients (oil, garlic, sugar, custard powder) in the kitchen. Ful, which is an everyday breakfast, is bought from the small grocery shop up the street. Amna does not cook ful herself because it takes too long and uses too much fuel. It is cheaper to buy it ready cooked if they want to eat it. They mainly buy seasonal food which was at the time I visited them tomatoes, okra, and cucumber because it is more reasonable.

It is Amna who decides what is bought. She controls the food stored at home and knows what is needed. She is the one who controls the money and gives the money which is needed for shopping to the one who goes shopping. Even if Amna never leaves the house herself for shopping no one of the family would go shopping without her orders. She is fully responsible for the diet of the family and no one else has to bother.

Amna preserves some of the food products which are needed for everyday cooking. She cleans, chops, and sun-dries okra, onions, and meat. Onions and okra (weika) are ground right

[93] Gas stoves, the small ones with two or three flames or the European style ones are always used with a gas bottle. There is no public gas supply network. If the gas bottle is empty it has to be refilled or exchanged. The shops to refill or exchange gas bottles are found in many places in town. As the gas bottles are quite heavy transport will be needed to get them home.

[94] The cabinet is a very important status symbol for a (especially urban) Sudanese household. From the size of the cabinet and the number and variety of good dishes and pots everybody can tell about the social status of the family. The cabinet is usually placed in the main living room or in the main room where visitors will sit. So visitors will see straight away what the family has to offer and if they are able to serve a big number of visitors with nice dishes and glasses. In small houses the cabinet might be found in the kitchen.

after drying and stored in closed glasses. The dried meat (shermout) is stored in strips and ground before using it. The amount of the dried products depends on the financial situation or whether guests are expected in the near future. Usually the drying it is done once a week or fortnightly. It does not require any special skills or a lot of time. The most time consuming part is cleaning and cutting the product. For drying the products are just spread on a big tray, placed in the sun for a couple of days, and turned from time to time.

Many families keep a starter for the fermentation of ajin to make kisra or aceda. Amna does not keep a starter because it has to be stored in a cold place to avoid spoilage. Since the fermentation process is very easy in the hot weather, Amna just starts the ajin in the evening and it will be fermented and ready for cooking in the morning. For that she mixes water and sorghum flour in a bucket and puts it in a warm place.

Daily Life and Cooking

One day I visited Amna and her family for a whole day. At the time I arrived (8 a.m.) Osman was just about to leave for work. Amna and her sister were already up but the children were just about to get up. They where sleeping in the yard and the women's shelter. They took their beds, brought them inside the house, and rearranged the beds within the shelter for the day. It was summer holidays[95] and the children stayed home. The second oldest son, who studies in Khartoum, was home to visit.

Amna and her sister disappeared into the kitchen and shortly afterwards we got some tea served by Amna's sister. To serve me with tea was a kind of funny event for them. Sudanese are famous for drinking over sweetened tea. The first time I visited them, we had some tea after lunch which I could not drink because it was far too sweet. So we all had a good laugh every time I asked them to give me tea with little sugar and not sugar with little tea. Of course the tea was always still too sweet for my taste.

The biggest challenge for the day was the fact, that I was without a translator and only the three youngest children spoke very little English. Nevertheless, the communication worked out very well. The best strategy in that case was to dive into their activities and join them in what they were doing. That automatically led to a very communicative atmosphere.

While I was still having my tea, Amna's sister cleaned the dishes and the girls started to clean the yard. When the dishes were done, Amna chopped the firewood which Osman had brought from the market for making kisra. The kisra was my reason to disturb the family so early. I wanted to join the kisra backing which Amna did first thing in the morning, because later on she said it would have been to hot to sit next to the fire. At first sight, making kisra seems very easy. The dough had already been prepared in the previous evening and fermented over night. Amna only added some more flour and water to get more dough and to lessen the sour

[95] The summer holidays start with the hot season in February/ March. Usually they last 3-5 months depending on the weather. The schools are not very well equipped and it is too hot for the children to sit in school. The start of the new school year usually is announced by the news.

taste a little bit. We sat down in the little kitchen yard and lit the fire. The temperature was not too bad yet, but as soon as the fire was set it got really hot and smoky. The smoke was the worst thing since it was very aggressive, biting the eyes. When the fire settled a bit Amna took the rectangular baking plate (*saj*) and put it on the fire. When the plate was hot, she took a little piece of cloth which was soaked with animal fat from raw meat and rubbed it on the plate to prevent kisra from sticking to it and cleaning the plate the same time. Then Amna took a small bowl which she used as ladle to put dough on the plate and instantly spread it with the *gergeriba*. The kisra was ready after a few seconds when its edges started to come off the plate. She pulled it off the plate and placed it on a big tray covered with a piece of plastic foil. The spreading of the kisra is the one skill, the other one is the control of the fire. If the fire is too hot, the kisra burns. Is it too cold, the kisra will take long to bake and might not be baked properly. Of course I had to try baking kisra. I really cannot say which was worse: the heat of the fire or making a fool of myself. The kisra I made was not a thin compact sheet but a thick something with holes in it. Of course everybody was watching when I made the kisra. The embarrassing result was put to the other proper sheets of kisra and with a smile Amna promised it to me for lunch. In the meantime the two oldest sons had finally gotten up and the youngest daughter made and served them tea. So the kitchen got crowded - Amna and me in the little front yard and her daughter in the kitchen boiling water on the gas stove. It did not take long before Amna's sister jointed us in the kitchen to make salabiy. She just did the preparation which was mixing flower with some yeast and water to a smooth dough and put it aside to rise.

Even if Amna had agreed to treat me like her daughter – and I am sure she was glad that I was not because of my kisra skills – they made some special food for me. The first time I visit them my friend asked Amna to make *salabiy*, a donut-like sweet from wheat flour fried in oil. I loved it so much, that they prepared it again for me. As I knew they would make it for me, Amna agreed that I would bring the ingredients along.

It did not take to long and the neighbour woman appeared on the other side of the property wall right next to the kitchen. Since the wall is more than 2 meters high she had to stand on something to reach over the wall. There was a lot of greeting and chatting and talk about the German girl who tried to make kisra and loves salabiy. In the end Amna passed a bowl of kisra dough to the neighbour and a few minutes later she also sat on the old bed in the kitchen yard and Amna's daughter made her some tea. Six people were in the tiny kitchen at that time, making kisra, salabiy, and tea with a lot of chattering.

Generally, it is very common that a neighbour women stops by for a few minutes to have a cup of tea and to exchange some gossip and news. In this special case, however, it seemed that the relationship to this neighbour was very good since they also help each other out with water and food. The daughters also went to the same school and were good friends.

After about one hour we had finished baking kisra. It seemed that the fire was exactly enough for kisra Amna backed. In the end she made kisra from dough filling a five-litre bucket which would last for two days. Meanwhile, the youngest son came home with some shopping. Amna had sent him to the market to get some food for breakfast. Still, some stuff was missing for

the day and the youngest daughter and I went to the little shop to buy some more stuff. We bought two packs of Sudanese pasta some black pepper, and fresh garlic.

When we came back from the shop the other daughter was already busy in the kitchen preparing food. Amna and her sister had disappeared for a while to get themselves ready, since they did not have any time for it since they got up. It looked like the girls knew exactly what to do while Amna was not there. The older daughter started to fry sheep's liver while the youngest daughter and I ground black pepper and peeled and ground the fresh garlic. The grinding was done in a wooden mortar with a metal pestle. The ground black pepper and fresh garlic were put into small containers which stand next to the gas stove. We all stood in the small kitchen and there would have not been enough place for a fourth person to join. Still, the youngest son popped in and out curious what we were doing. The two other sons had disappeared after they came to the kitchen to ask for the tea. After a while Amna's sister came back to the kitchen and used the gas stove to cook pasta. For that she heated some oil in a pot and fried the uncooked pasta for less than a minute before she added cold water to it. While the older daughter made scrambled eggs the youngest one cleaned vegetables and did the dishes. After setting up the pasta Amna's sister already started to prepare more food for lunch already by cooking chopped meat in a pot on the kanon and peeling potatoes. The second daughter was in charge of the pots on the gas stove and it seemed she got a bit overwhelmed with her tasks. The pasta was boiling over and she did not look happy the way the scrambled eggs went. It is obvious that she wanted to do everything right but she was still lacking some skill to do several things at the same time. While she and I tried to keep the chaos at a limit the youngest daughter set the tray for breakfast.

At about 10:30 it was time for breakfast. The set tray contained ful which was brought from the shop by the youngest son and still hot, scrambled eggs, liver, and bread. The breakfast was served for the sons who just came back, joined by a friend that time. The food for the boys was served by the youngest daughter. While the boys were eating in the men's shelter the girls and women kept the kitchen going. When the boys finished their breakfast the oldest son returned the tray to the kitchen. By that time I was asked to sit down in the women's shelter and get some rest before breakfast.

After the boys had finished the tray was refilled and the female family members and I had breakfast sitting around the tray in the women's shelter. We were joined by the youngest son who at this age is free to choose with whom he wants to eat. After breakfast the two girls and women disappeared back into the kitchen. So there was no tea or rest from the morning's work. During the breakfast the meat had been boiling on the charcoal fire but it was not ready yet. The youngest daughter chopped potatoes and started to fry them on the gas stove. The other daughter was doing the dishes and Amna's sister fried the salabiy. The dough by then had enough time to gain. For frying the salabiy the sister heated about one litre of oil in a wok-like pan on the kanon. With wet fingers she put little pieces of dough into the hot oil. It took a few minutes until the salabiy was ready. Meanwhile she ground some sugar in the mortar which was sprinkled on the finished salabiy. Amna and I started to clean and chop onions, okra, and some more meat. Cleaning of okra is not very pleasant. The fruit have many little

scratchy and stingy hairs which make the handling very uncomfortable. Nevertheless, okra is one of the most important vegetable and is used almost every day.

After Amna's sister finished making salabiy she prepared minced meat. She put chopped meat in a pan and on a little charcoal fire, precooked it, and then minced it with a manual mincer[96]. After mincing the meat, she added it to the fried potatoes in addition with some spices and tomato paste, and the first meal was ready – called *geema*.

Next Amna and I made mulah. For that we added water, the chopped onions, and okra to the already cooked meat, added some salt and pepper, let it cook on the charcoal fire, and stirred it from time to time. After everything was ready we all cleaned the kitchen and Amna's sister took one of the charcoal ovens into the women's shelter where we sat down and she made some coffee for us. Enjoying the salabiy and several cups of extremely strong coffee it was obvious that Amna and her sister now had some free time to relax. Nice strong coffee is something Amna treats herself with everyday to relax from that stressful housework.

Drinking coffee is a special procedure. To prepare a proper coffee, the unroasted beans are roasted in a little pan on the charcoal fire until they are nearly black. Then the hot beans, maybe some cardamom is added, are ground in the mortar, the powder is put into boiling water, and left to boil for a few minutes on the kanon. Then the coffee is sieved into a metal or pottery coffee pot and served in glasses or little cups with sugar. Often spices like cinnamon or ginger are added. In that case some of the spices are put into the sieve and the coffee is rinsed through it or the spices are added to the boiling coffee. Usually every household has a kind of coffee preparation kit which contains a little pan, a metal pot often made from an old can (500 to 750 ml), a little piece of palm leave fibre (or plastic wire) which is used as sieve when the coffee is filled into the coffee pot, a sieve, a metal or earthenware coffee pot, and a few glasses with spices. Drinking coffee includes the procedure of preparing it. It is a very communicative and identity creating procedure. Usually coffee is made when neighbours stop by to chat. However, it is a quite expensive procedure as coffee, sugar, spices, and maybe some kind of sweets are needed. It is common that neighbours bring some of the ingredients to share the cost.

After we had finished the cooking it was time for a long break. The girls, Amna's sister, and Amna were exhausted from standing and sitting in the hot kitchen all the time. So the girls got the TV out of the house and put it in the women's shelter and everybody settled for a rest.

We had just finished in time for a special TV programme – a Lebanese cooking show. To my big surprise everybody started singing along with the title song of the show. The show itself was hilarious. A male chef cooked western style food. Assisted by a model-like female he made turkey, cooked potatoes and carrots, and a cake as dessert. Not only that the kind of

[96] This method of producing minced meat is very common in Sudanese towns. The meat is precooked otherwise it will be too tough for the mincer. Nevertheless, the meat should not be cooked to long otherwise it will lose too much fluids and fat and the minced meat will be too dry. Minced meat can also be found on the market, but it is not very save to consume due to the lacking hygienically conditions. Furthermore, it is much cheaper, nicer, and fresher when it is homemade.

food is far out of reach for most Sudanese. The assistant was the best example of a modern woman who has never been in a kitchen and much less has done any cooking before. The girls followed the 20 minutes show with great excitement.

At about 4 p.m. Osman came home from work, so all the women and girls got busy again making his life comfortable. He brought some fresh salad (tomatoes, cucumber, and spring onions) from the market, which Amna's sister immediately took, into the kitchen. While the girls got busy in the kitchen again, Osman went for a nap. Amna's sister made some fresh salad and the girls made some dessert – rice with custard. The other food had already been cooked during the day and just had to be set up. By the time Osman had gotten up and finished his praying everything was set and it was time for lunch at about 5:30 p.m. As for the breakfast the men were served first. About half an hour later, when they had finished Osman returned the tray and it was set again for the women.

The Meals

The family has two proper meals a day; breakfast and lunch. Apart from that they have some tea maybe some biscuits in the early morning and some milk with bread at night. The food is served in the traditional way on the round tray (*siniya*) and eaten with fingers. For certain dishes like pudding or rice spoons are used. As soon as there are any visitors – male or female – they eat separated by gender. As it is very common in Sudan to have visitors and Amna's family has many of them, they very seldom eat all together.

The family eats breakfast at about 10 to 11 a.m. Since the children had holidays the breakfast consisted of ful, omelette, liver, and bread. The liver was served only because I was there. There was no salad and only 3 dishes what is simple for urban standard. When the children go to school and Osman and the oldest son to work, they eat their breakfast out. They usually buy sandwiches or ful. Only the youngest son comes home for breakfast since his school is just opposite the street. So usually, Amna and her youngest son have some ful and bread which they get from the small shop.

For lunch we had kisra with mulah (bamia), salad, and since I was there, geema, pasta with white cheese, bread, and sweet rice with custard. The men were served first and after they had finished the tray was set again with the same food and the women started to eat. By that time two other female visitors had arrived. So it was seven of us. It was obvious that the variety of the meal was special for the family. The girls enjoyed the geema and pasta, even if the amount was quite small. Only one small plate of each was left for us but there was plenty of kisra with mulah. The girls hardly ate any kisra which is their everyday food and concentrated on pasta and geema. Of course the kisra sheet I made eventually appeared – unfortunately one of the visitors got it but she was very polite and thanked me for cooking her lunch. Without special guests like me the family would just have had kisra with mulah and some salad. After the meal we had sweet tea.

The way this family eats is not very common anymore. It is normal that the gender eat in separate rooms when the family has guests. However, it is very uncommon – especially in

urban areas – that men eat first and then the same tray is refilled for the women. It is very traditional and many Sudanese call it 'rural'.

Special Occasions

The menu of Amna's family changes little for special occasions. They mainly have one or two dishes in addition. For example, on Fridays they might have aceda and sweet pasta (*sheiriya*) in addition to ful for breakfast, and two types of mulah, some salad, and some sweet dessert for lunch. In addition they might make pasta and an urban dish like geema. This is mostly because Friday is the 'visit day and it is always possible that guests will have to be served. Even during Ramadan the diet of the family stays simple and monotonous. They only will change to aceda and mulah for the fast breaking instead of having kisra.

Individual Perception of Food Habits and Changes

Amna as the responsible person for the family's diet takes care that the food for the family is healthy. For her oil and onions are the basis for the food. She says, she would cook more meat if they could afford it. Eating kisra with mulah every day does not bother the family and Amna says it is very healthy and makes strong. She believes that tabikh would not be better. Her parents and grandparents ate kisra and mulah all the time and were healthy and strong. Amna's favourite food is kisra and mulah bamia (okra). The children also love kisra with mulah but they confessed that they prefer pasta and geema, but also like kisra and aceda a lot. The sons would prefer more meat, chicken, and fish. Nevertheless, these are dishes the family cannot afford and the children do not complain but enjoy special occasions with their favourite food even more.

The food habits of the family have not changed much compared to the past. Their dishes and especially the way of eating are very traditional. Of course some urban characteristics were adopted like having bread, ful, fruit, salad, pasta, geema, and dessert and they also eat more meat than Amna's or Osman's parents did.

Conclusion

Amna is in full control of the kitchen. Even if the daughters help a lot and independently cook whole dishes on their own, Amna controls the result or even the preparation process. Amna is also the one who prepares the more important and difficult dishes like kisra and mulah. Nevertheless, the daughters know what has to be done in the kitchen and there are not many words necessary to tell them. The daughters also take the responsibility to prepare tea no matter if there are visitors or not. It has to be taken into account that during my visit the girls were on holiday and had a lot of time to spend in the kitchen. Also Amna's visiting sister does a lot of the work in the kitchen, but when she is not there and the girls go to school, Amna does all the cooking on her own. Preparing food for the family is the main task of Amna's day. She spends many hours with food preparation every day. The food preparation is very time consuming and also physically exhausting because of the climatic and technical conditions. It took from early morning until about 2 p.m. to do all the cooking and another 30 minutes before lunch to set the tray, with 5 women (including myself) preparing the food. The way

Amna prepares the food is typical for El Obeid. As families live in houses with open yards it is normal to cook with the kanon. There are dishes which are said only to taste good cooked on a kanon or wood fire like aceda, kisra, and mulah.

Amna does not only control the processes in the kitchen she is also the one who manages the family's money. Neither she earns the money nor she does the shopping. Still, she decides what is bought because she says, she is responsible for the family's diet.

The food habits of Amna's and Osman's family are quite traditional for an urban household. Even if there are some urban dishes in their diet like ful for breakfast, their main meal – the lunch – mainly consists of kisra with mulah[97]. The meals are mainly determined by the family's income. Since they only live from one income there is little opportunity for expensive meals like tabikh or meat. Amna says this is the first thing she would change, if they had more money. They would eat more meat.

Furthermore, it is very uncommon these days that the men eat before the women and not at the same time even if separated. This was the only time I ever experienced it anywhere in Sudan[98]. Today it is common that two trays are set– one for the men and one for the women - and they eat separated but at the same time. In this case there had been enough of the staple food for everybody. Nevertheless, the women depend on what the men leave over. The strict separation of the gender also reflects in the character of the household and the behaviour during the whole day. The older sons seemed to avoid the women's area. They only dropped by to get something to eat, to talk to their mother, or to greet female guests. Usually I experienced that sisters and brothers were sitting together and chat or watch TV. In that case it seemed they were isolated from each other and did not really communicate. The older sons where in and out all the day and did not contribute at all to any homework. It seemed they have a much more relaxing life than their sisters do.

12.2 Hiba

House and Family

Hiba (38) and Mohamed (43) live in the quarter Gallah which is located on the eastside of El Obeid. To get from there to the town centre it takes about 10 to 15 minutes by bus. Many families in this area have moved to El Obeid within the last few decades and the area can be categorised into the second circle of my division of the town. About a five-minute walk from the family's house is Gallah market. It has a few grocery stores, a bakery, a couple of restaurants, and a few stalls where fast food like ful and tamia are sold. One woman, living in a house next to the market, also serves aceda in front of her house in the morning for breakfast.

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[97] This was the only time that I ate with a family for lunch and without being served tabikh. Normally, this is a must in towns even if many women complain that it is very expensive and time consuming to prepare. Amna told me that she never cooks tabikh because it is too expensive.

[98] One reason might have been that the women serve the men and in case the men need anything the women will not be disturbed during their own meal.

Furthermore, there are some stalls where fruit and vegetables are sold. A few days of the week a butcher sells meat until noon and every morning until noon women sell small amounts of salad[99], maybe some vegetables, and homemade groundnut butter. The quarter has several additional grocery shops almost one on every corner. Even if the shops offer all kinds of food, cosmetics, and other things for the daily life, the supply has less variety compared to the shops around the central market. This quarter is also very close to the University of Kordofan.

Originally Mohamed and his family are from the area of Nahud (West Kordofan). They moved to El Obeid several years ago, because his father was ill and could get better treatment in El Obeid. Also it was easier to find work for Mohamed and his sisters in El Obeid. Hiba is originally from Al Rahda[100] and came to El Obeid to study and work at the university. A couple of years ago she studied in Germany for a few years. Today Hiba works at the university as a lecturer and Mohamed is a taxation officer. He works in El Obeid but quite often he has to travel to Khartoum for several days. He usually travels by his own pick-up car which makes him independent from the bus service. They have two children: a boy (3) and a girl (2) both of whom visit the kindergarten of the university.

Hiba's and Mohamed's house is part of a family house where his sisters and mother live. Even if there is a strong social bond and there is not a very clear dimensional separation, the young family lives quite independent. Their living space is quite limited with a hall, one big bedroom, and a small kitchen. In the hall are two beds, some armchairs, and a Television which is connected to a satellite dish. The yard is not very big either. They also have a small storage room without a roof where they keep stuff like chairs, buckets, and empty barrels. The bathroom is a separated building in the yard without a water connection or sewage. The toilet is also a small roofless house in the yard and is just a pit with a sealed floor and a lavatory pan.

The water supply is not sufficient. Although they have a pipe connection it hardly runs water. So they usually fill it in two big barrels in the yard to make sure they always have water. The electricity supply varies. Sometimes there are power cuts for several hours.

Hiba hired a housekeeper to help with the housework. She does the laundry, the cleaning (house, dishes), helps with the children, and sometimes does some small shopping.

Food Supply and Kitchen

Hiba's kitchen is well equipped. She has a three-flame gas stove, a big refrigerator, and also a separate small freezer. There are several cupboards in the kitchen and of course a cabinet. Hiba has plenty of pots, pans, dishes, glasses, and cooking utensils. She also has a pressure

[99] This is not salad in a European sense. The women sell tomatoes, cucumber, spring onions, and onions. They not sell the vegetables separately but as a set. I.e. for a certain amount of money the customer gets some tomatoes, cucumbers, and spring onions. This is just small trade. The women offer hardly more than a dozen of tomatoes, a few cucumbers, and spring onions. Sometimes they also have a couple of eggplants.

[100] Al Rahada is situated about 60 km southeast of El Obeid close to the border of South Kordofan. It lies on the shore of a big lake which is supplied by seasonal streams. The area is well know for vegetable production because of the water resources and climatic and soil conditions.

cooker, an electric kisra plate, and an electric hand blender. The hand blender she brought from Germany and calls it 'electric *mufraka*'. There are several containers and glasses with ingredients and spices. In one cupboard she has big buckets (5 to 10 l) with sorghum and wheat flour, rice, and sugar. As the kitchen is indoors she only uses the gas stove. If she wants to use the kanon for cooking, she will do it outside. The kitchen has no water tap, so Hiba has two big water canisters of clean water in the kitchen and one bucket for used water. The dishes are washed outside by the housekeeper several times a day.

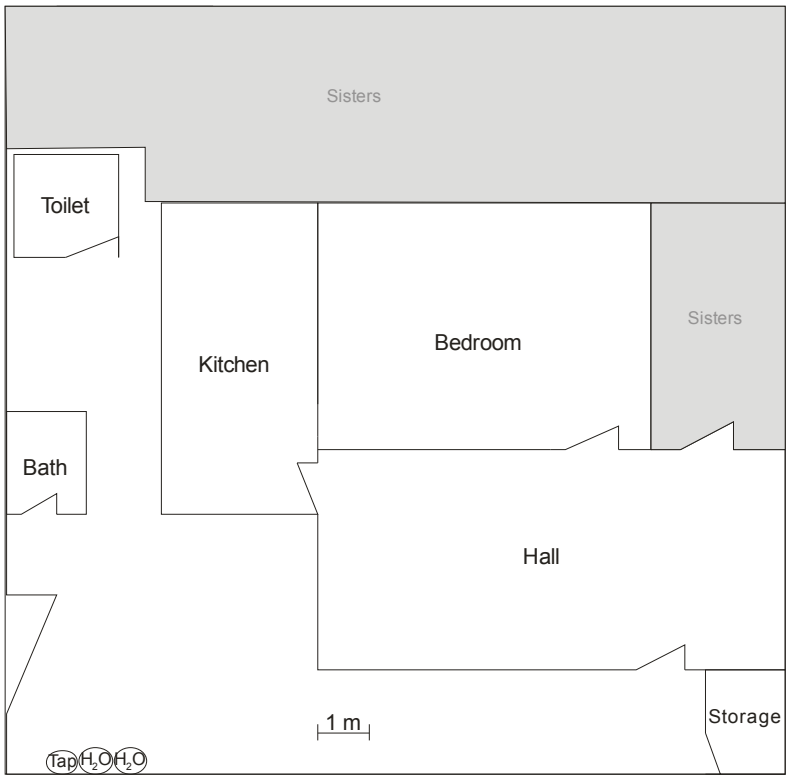

Figure 16: Property of Hiba's family

As both, Hiba and Mohamed earn money, they share the expenses for food and food related items. Hiba paid for the kitchen equipment. She says it is the wife's duty to supply all the pots, dishes, and cutlery because she knows best what she needs. For food they mainly use Mohamed's money. He also pays for all other living expenses. Although Hiba says she prefers to do the shopping herself because her husband does not bring the nice vegetables and fruit, Mohamed also does the main shopping. As he drives the car and works close to the central market it is easier for him to do the shopping. Sometimes Hiba buys some food in a quality she prefers when she passes the central market. In that case she also pays with her own money. From time to time she accompanies Mohamed when he goes shopping. Then she selects the food and he pays. It might also happen that her sisters-in-law goes to the central market and brings some vegetables or fruit for them.

The frequency of shopping depends on the product. Flour, rice, sugar, pasta, and custard are bought in larger amounts[101], so they will last at least two weeks. The shopping of larger amounts is possible for several reasons. Firstly, they have the space and facilities to store the food. Secondly, they have enough money to buy bigger amounts. Thirdly, they have a car to transport the shopping home. Fresh vegetables and fruit are bought every two to three days. That way they always have fresh food. Mohamed buys it on demand. Smaller shopping of missing items is done at small grocery shops in the area. Even though Mohamed does the main shopping, Hiba is responsible for the family's diet and she tells him what to bring. She prefers seasonal food, not only because of the price but because of the freshness and quality of the products.

Hiba is very conscious of the quality of the food they eat. She tries to avoid processed products because of preservatives and artificial flavours. When she buys processed and convenient food like cans or yoghurt she always checks the expiry date. Hiba thinks that her favour for fresh fruit and vegetables comes from her place of origin. Al Rahda, where her family comes from, is an important vegetable growing area in Sudan.

Hiba does not do any sun-drying of meat or vegetables because there is no space in the yard for it and it is too time consuming. She prefers fresh food anyway. Things like the starter for aceda and yoghurt are stored in the fridge where all fresh food is stored.

Daily Life and Cooking

Hiba's family is a typical urban family. As she and Mohamed are working during the week the whole family leaves the house in the morning. Before that they all have some tea with milk and biscuits. For breakfast Hiba and the children take sandwiches with them and Mohamed buys breakfast in the town. In the morning the housekeeper comes and starts cleaning. She also gets a meal at Hiba's place. Even though she does not eat with the family, she gets almost the same food.

When Hiba comes home from work in the early afternoon, she starts to prepare lunch before the children come home. All the cooking is done in the kitchen with the gas stove. Hiba uses the kanon only to roast some meat, which she and Mohamed like very much. Hiba prefers not to do the time-consuming tasks in the kitchen herself and sometimes asks the housekeeper to do things like peeling garlic, preparing other spices, and cleaning vegetables. However, the cooking is all done by Hiba herself. For Hiba it is important to get all the food ready before the children come home. They want attention and then she has no peace to get the cooking done. Sometimes, especially before Fridays, holidays, or when guests are expected she prepares the meal the previous evening to get everything ready for the next day. When she cooks aceda for Friday she does it early in the morning when the children are still sleeping. Since aceda and kisra have to be eaten fresh, she cannot prepare it the previous day.

[101] When buying larger amounts the price per unit is lower than buying small amounts. Still, it requires the liquidity to invest a bigger amount of money at once which is not possible for many low-income household. So they have to buy smaller amounts to a higher price per unit even if the spend less money for the moment.

For Hiba some dishes have to be part of every lunch. For example, it is a must in towns that tabikh is served for lunch. Therefore, she only cooks it for that one reason:

> "When visitors come I have to have tabikh on the table. There is no excuse for not having it. People will say I cannot cook it or I am a bad wife or the family is too poor to cook it. So I have to do it. But making tabikh is very expensive. You need a lot of onions, oil, and meat and it has to cook for a long time."

It is very likely in Sudan that visitors turn up suddenly and of course they have to be invited to stay for the meal. Many women always prepare the meals as if visitors are coming. Apart from tabikh, the number of dishes served for lunch is also very important. For a normal weekly lunch four to five dishes have to be served to give a good impression.

Certain dishes Hiba prepares every day because they have to be fresh. Some she only prepares every two or three days because they can be kept in the refrigerator a few days. Tabikh, she only prepares twice or three times a week. She cooks bigger amounts that will last a few days and so she always has tabikh available. Another dish, which she always has at home and prepares to last for a few days, is ful. She soaks the beans in water for at least 12 hours. After that she boils them with the pressure cooker for 30 to 60 minutes on the gas stove. Hiba also cooks lentils a lot because the children like it. This does not take too much effort as the lentils just need to boil for about 30 minutes. Furthermore, Hiba regularly cooks geema and fried eggplants (*salata aswad*), which are other common dishes in the urban area. Another dish she makes for lunch is stuffed vegetables (*mashi*). Preparing those is very time-consuming. The vegetable (tomatoes, sweet pepper, eggplant) have to be hollowed out. Then minced meat, onions, tomato paste, and spices are mixed, fried, and stuffed into the hollow vegetables. These have to pot-roast in a lot of oil for quite a while. It is a dish Hiba cooks maybe once or twice a month. Sometimes she cooks *kufta*, a fried sausage made from minced meet (similar to meatballs). Food, which Hiba prepares freshly almost every day, is pasta and potato chips. Moreover, she makes fresh salad for every meal. For her salad it is a must with every main meal as well as fresh fruit salad as dessert for every lunch.

As Hiba tries to avoid processed food, she makes yoghurt herself. This is very easy in the hot climate. She just takes some fresh milk which has not been boiled and adds some starter to it. This can be some of the previous yoghurt or some starter pellets she buys in a store. Then she leaves the slightly covered container in a warm dark place for several hours.

One day when I visited Hiba it was her day off. She stayed home the whole day because Mohamed had been in Khartoum for a few days and was supposed to arrive the next day. She wanted to prepare a few things. Therefore, my visit was very welcome as she had company and help for that day.

When I arrived early in the morning Hiba was away taking the children to the kindergarten, so her sister-in-law let me into her house and offered me some tea. The housekeeper was already there and had cleaned the house. After Hiba arrived and I finished my tea we went straight to her place and into the kitchen to prepare our breakfast. First Hiba put the ful on the stove. She wanted to make sure to have ful in the house for Mohamed. Moreover, it was Thursday and she wanted to have fresh ful for Friday. For breakfast Hiba decided to make aceda with mulah

nieimiya. Usually she would not make such an effort for a breakfast during the week but since I visited her she decided to make something special. This mulah is one of the thickest since it contains minced meat, groundnut butter, tomato paste, and yoghurt. For the Aceda she mixed sorghum flour and some wheat flour with water and added the starter, then leaving the dough for a while to ferment. Hiba said that it would even be very easy to start the fermentation without a starter. As the temperature is so high the flour just has to be mixed with water and left for a few hours and the fermentation will have started. For aceda Hiba prefers white sorghum flour, as it gives the aceda a smoother and softer texture and she has to mix it with less wheat flour. Therefore, the wheat flour is just for the soft texture, which according to Hiba, is typical urban. In many rural areas people prefer a very stiff and strong aceda which can hardly be cut with the fingers when eaten.

To cook the mulah we used oil, chopped onions, white groundnut butter (unroasted groundnuts), meat, yoghurt, tomato paste, and spices (garlic, coriander, weika). Traditionally, the meat used for many types of mulah is shermout. Many urban households prefer minced meat, since it is easily available and has a milder taste[102]. In our case Hiba used precooked meat mincing it with her electric German hand blender. She really loves the hand blender because it saves her time and makes live much easier. She also uses it to chop vegetables into very small pieces. While making mulah the beans were ready. Hiba stored the beans in the refrigerator and would spice the ful just before eating.

After the mulah was ready we made the aceda. The dough was fermented for a little while just like Hiba prefers it. She does not like it when aceda is too sour as it gives her stomach trouble[103]. Hiba cooks aceda on the gas stove which is not traditional at all. Aceda is cooked in a special pot (hala bramo) which is a round and spherical-like pot with a deepened bottom. That makes it easier to stir the aceda. The pot sits best on a kanon in a charcoal fire. The size of the pots can be fairly small (about 2 l) going up to the size which would allow cooking a lamb in it. Hiba told me that people outside Khartoum usually use a kanon and say the people in Khartoum are so ‘civilised’ that they do not know how to make aceda properly. As preparing aceda on a kanon has to be done outside and she has little room and does not want to sit outside Hiba cooks it on the gas stove. However, it is very uncomfortable to cook it on the gas stove because one needs a lot of strength and skills to stir the aceda. It is easier sitting next to the pot instead of standing in front of the stove like Hiba does. When the aceda was ready Hiba filled it in a plastic bowl by using a saucer she dipped into water before cutting the aceda out of the pot. Then it had to cool down for a bit to become firm. She also put aside a small aceda for the housekeeper. While it was cooling down, Hiba heated up the leftovers lentils from the

[102] Using shermout and minced meat leads to a very different taste and viscosity of mulah. With minced meat the meat crumbles are soft and taste of meat. With shermout the mulah has to boil a little longer and the meat crumbles are still a little firm and tough and smaller compared to minced meat. Shermout also has a strong flavour and slightly rancid odour. So using shermout or fresh meat may be a taste preference. In Hiba’s case it is also a time and space factor. She thinks it is too time-consuming to dry meat and she not has the place to dry it.

[103] Several people say they prefer unfermented or just slightly fermented aceda as fermented aceda gives them stomach trouble. They say it is too heavy for the stomach.

previous day. I made some fresh salad from tomatoes, spring onions, cucumbers, and rocket (*Eruca sativa*). When it was breakfast time for us, we ate the aceda with mulah nieimiya, lentils, salad, and bread. It was quite an unusual breakfast during the week for Hiba but she enjoyed the nice food. After breakfast the housekeeper got us some soft drinks and of course tea was not missing. Hiba made it and insisted that we also have some coffee. The atmosphere was very relaxed and Hiba enjoyed coffee in company. She loves to drink coffee but not alone. For her it is a very relaxing event and a time in which she does not have to worry about anything for a while. Of course Hiba made the coffee herself by roasting the beans, grinding them, and boiling the coffee.

After the coffee break we got back into the kitchen. It was around noon and had gotten very hot by that time. Standing in the kitchen and cooking almost became a challenge. But we still had to prepare the mulah bamia for the next day. Mohamed would be back and it would be Friday, so Hiba had to make something special. Some women prepare mulah bamia by cooking meat and a chopped onion with spices in water for a while and then add the okra to it when the meat is almost ready. Hiba cooked the meat with onions and spices separately. When the meat was ready she sieved the stock and used it to boil the okra. The okra was ready when the seeds were soft and Hiba added some solved sodium carbonate to thicken it. The reason why Hiba does not cook the meat with okra is that the meat is nicer when it is not over-cooked and stirred. Therefore, Hiba adds the meat afterwards.

To make mulah bamia that day was very important for Hiba. By preparing nice food and making sure the refrigerator is filled to the top with fresh and nice food upon his return, Mohamed will see that she is a good and caring mother and wife. In addition to mulah bamia she would make kisra the next day. Even though Mohamed does not like kisra and Hiba does not like to bake it, he will appreciate her effort.

While we were cooking the mulah the children were brought home by a the housekeeper from the kindergarten and I realised what Hiba meant when she said she wanted to get the cooking done before the children come home. Besides the cooking we now had to play with the children. Of course they were curious of what we were cooking and the daughter wanted to be held on the arm to see what was going on. Furthermore, they had to eat a little. Hiba gave them some yoghurt. Thou her daughter decided that she wanted pudding, so we made pudding. It took a while to make it because the mulah was not finished. When the pudding was ready the daughter had fallen asleep. Next Hiba made some potato chips for lunch and we made the fruit salad for dessert. The son really loves fruit so he stood next to us and stole some fruit pieces from time to time. Mango was his favourite and when he found out that I like it too, he stole some from his mother and shared it with me. And I had to chop another mango for the salad.

The lunch preparation that day was quite quick. The tabikh was ready from the previous day, and so was the rice. We just made some salad and Hiba got some pickles she had made herself. Actually she made them for chicken dishes, but she wanted me to try some. We had lunch at about 5 p.m. and ate some tabikh, potato chips with ketchup, salad, pickled vegeta-

bles, bread, and sweet rice. Hiba's son ate with us while her daughter was asleep. She would have lunch when she woke up.

In the later evening Hiba usually prepares some light supper. Often it is just some rice pudding, gurrassa, sweet pasta, or ful. Since the children just drink a cup of hot milk[104] for supper she never makes a big deal to prepare something at night. As we had already two big meals this day Hiba did not serve any supper apart from the milk for the children.

The Meals

The family members have three meals a day; breakfast, lunch and supper. In the morning before leaving the house the family has some tea sometimes with biscuits. Hiba makes sandwiches for the children and herself to take them out. Usually she makes them with ful, lentils, cheese, or eggs whatever the children like best. Sometimes she also puts sweets like jam or tahniya[105] on the sandwich. The children can choose what they want on their sandwich. Mohamed usually buys something for breakfast in town. If Hiba stays home for a day, she usually has some salad and some leftovers from the previous day. That means the breakfast we had the day I visited her was a big exception. The children have a light snack (yoghurt or fruit) when they come home from the kindergarten. Lunch is the most important family meal of the day. They usually have it at about 5 p.m. when Mohamed comes home from work. The meal contains about four to five dishes of which one has to be tabikh and one is salad. The other once could be geema, stuffed vegetables, meatballs, potato chips, rice, pasta, chicken, or meat. Furthermore, bread is served. Since the children eat the same food as the parents Hiba makes sure she serves food the children like. Supper at about 9:30 p.m. is a light meal. They may just eat some sweet rice, eggs, or a sandwich. Sometimes Hiba makes some grilled chicken which they like a lot. After the meals they usually have some tea. Otherwise Hiba prefers if the family drinks traditional drinks like tabaldi, roselle, or fruit juice instead of commercial soft drinks.

The food is served on the siniya from which they all eat with hands. For rice or pasta they might use a spoon. If they have guests, depending on the guests, they might eat separate by gender. As they have not much space the men would eat outside in the yard and the women indoors. When they have friends of the same age visiting or colleagues from university they all eat together. Once I was invited to a supper party at Hiba's and Mohamed's house. They had invited a couple of male friends who also worked at the university. Since we all knew each other and apart from Mohamed all had lived abroad for a couple of years, we all ate together. At this event the food was not served at the siniya but Hiba prepared a buffet what she always does if she invites friends for supper.

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[104] The milk is bought from the milk men in the evening or early morning. Just after sun rise and after sun set the milk is collected from herdsmen and brought to El Obeid. It can be bought in the market but it is also very common that the milk men go along the streets selling the milk. This milk is not treated and has to be boiled before drinking.

[105] Tahniya is a very sweetish sweet made from sesame.

When visitors stop by Hiba always serves them sweets and drinks first. Water is not considered as a drink as it is a staple. She either prepares some tea or offers juice of soft drinks.

Special Occasions

Holidays and special occasions in the Sudanese culture all ask for special meals[106]. On Fridays the family stays at home and has breakfast together. The weekday breakfast differs a lot from the Friday breakfast. According to Hiba the tradition requires a Friday breakfast of at least five dishes. Aceda with mulah is the main dish. For many Sudanese in West Sudan a Friday breakfast without aceda and mulah would not be a Friday breakfast. The traditional mulahs for Fridays are mulah rob and mulah shermout. In Hiba's opinion aceda would not be necessary for a Friday breakfast but she has to make it in case of visitors. Apart from aceda with mulah a sweet dish has to be served with it. This can be sheiriya, which is traditional, or salabiy. It is impossible to serve a breakfast with aceda and without a sweet dish. If Hiba knows that there will be no guests on Friday, she does not care too much to make sheiriya but she will make aceda. The other dishes are most commonly ful, salad, falafel, eggs, cheese, and bread. Bread does not count to the numbers of dishes even if it is a basic like aceda or kisra. It is more likely to be a matter of course for every meal.

On Fridays' lunch at least eight dishes have to be served. The most important ones are tabikh and kisra. Furthermore, Hiba usually makes some potato chips, geema, stuffed vegetables, meatballs, pasta, salad, or meat. Meat is very important if they have visitors. Not serving meat would give the same impression like not serving tabikh. Afterwards a dessert is served which in Hiba's case is usually fruit salad or pudding.

Perception of Food Habits

When Hiba prepares a meal she is very conscious of the nutritional value of the food and aims to cook healthy food. She prefers fresh and unprocessed foodstuff. Moreover, she tries to buy meat early in the morning and only real fresh one which has not been hanging in the dusty and hot streets all day, being attacked by flies. Especially, because of the children she takes care of a healthy and sufficient diet. Salad made from tomatoes, spring onions, cucumber, carrots, or rocket Hiba serves for every main meal like fruit salad as dessert. Hiba prefers to give the children fruit salad instead of whole fruit. The fruit they would just carry around, drop it in the dust, and flies would come eventually. This consciousness for a healthy and clean diet for the children also shows in her awareness of illnesses from spoiled or contaminated food and water.

This awareness of a healthy diet also applies for drinks. She prefers her family to drink traditional fruit juices instead of commercial soft drinks. Even if she adds sugar to the homemade

[106] For holidays and special occasions it is usual to serve traditional food. Even if the 'traditional' food in towns is not hundred per cent traditional and many dishes are originally from the Mediterranean, Turkish, Egyptian, or Arab region they are seen as traditional urban food in Sudan. Meals for a special occasion would be similar to the Friday meals. Depending on the event some extra dishes as extra meat, a special tabikh or a bigger variety would be on the menu.

juice it still is less than in the commercial ones which also contain artificial colouring and flavour.

Hiba perception of food is very progressive and focuses on an organically and healthy diet. She would not stick so much to the traditional Sudanese food if the norms would not require it. Many dishes are not very healthy because of the high oil and fat content. She thinks that one gets easily fat from permanently eating the urban Sudanese food. Even if she has to prepare many of the dishes, she still tries to supply her family with a sufficient and healthy by using many fresh and unprocessed products.

If Hiba had a choice, she would prefer not to make tabikh and meat, because she and the children do not like it much. The children do not even eat minced meat in mulah. Still, all four of them like chicken. Since Mohamed also does not like kisra Hiba only prepares it on Fridays or holidays when she expects visitors for lunch. So she always makes sure to cook food the family, especially the children, love to eat. She does not insist that they have to eat anything they do not like.

Changes of the Diet

Compared to the food habits of her parents and grandparents there are clear changes in the food habits of Hiba's family. Her grandmother's family was quite poor and lived in the rural area. They had a few animals which supplied them with milk. Her grandmother did all the cooking on a wood fire. They only ate two meals a day: breakfast and lunch. Both were quite similar containing aceda and mainly mulah rob. Sometimes they also ate aceda with mulah bamia or shermout for lunch if they could afford the ingredients. Very seldom they ate kisra (which is not traditional in the West) when the grandmother had time to prepare it. The daily life as well as the diet of her grandparents was very monotonous: they had an early breakfast, went to the field and did the field work, collected wood, water, and some crops, and went back home in the early evening and had lunch. When the grandmother was old she moved to the town (Al Rahda) where the food habits of the family changed significantly.

By contrast Hiba's mother already lived in the town and according to Hiba belonged to the middle class. She used to cook on the kanon (charcoal) and only aceda and kisra on wood fire[107]. Her parents had three meals a day. For breakfast they had aceda, ful, or lentils and sometimes even meat. For lunch they ate kisra with tabikh, salad, chicken, bread, and sometimes meat, mashi, or kufta. For supper they usually ate sweet rice, gurrassa, or sheiriya. Her parents had plenty of chicken, so they ate chicken almost every day. Hiba said when her mother made meat it was made with far too much onions and oil. Her mother though that this is healthy. Hiba thinks there should have been more salad.

When Hiba compares her food habits to the ones of her mother or even grandmother she thinks the kind of food in the past was much healthier because they used non-industrial food only. The food her mother and grandmother prepared was freshly made every day. For Hiba

[107] Many women believe that aceda and kisra has to be cooked on a wood fire to be of best quality.

that is not possible since she is working and the expectations in the towns did grow over the years.

Hiba prepares many of the same dishes as her mother did. Still, she has changed the methods. Her mother mainly cooked with charcoal which Hiba only uses to grill meat or chicken. Hiba says it is much more comfortable to cook with gas; it is cleaner and faster. Also she does not eat so much chicken and meat as her parents did but much more salad, vegetables, and fruit instead. Unfortunately, she also uses more industrial food since some products are more comfortable to use and somehow she could not imagine preparing dishes without them.

Conclusion

As in the most Sudanese households Hiba as the wife and mother is in charge of the kitchen and food preparation. She not only decides about the food preparation and prepares the food. She also decides what is bought, even if Mohamed pays for the food most of the time. Hiba does not mind to do food shopping herself and on her own when she has the time. Even though Hiba is in full charge of the kitchen sometimes her husband makes some tea. But she does not like it if he uses the kitchen, because it is her space.

Hiba is what people call a 'modern lady'. She has children, a working husband, and works at university herself. This image she presents very proudly through her behaviour and her lifestyle. As a married woman she wears a tob in public, differentiating between the ones she wears for work and the ones she wears going to a neighbour or relative. Working women especially in formal and higher employment wear white tobs when they go to work. A colourful tob Hiba only wears when she visits a neighbour or a relative. Her attitude towards a modern life also reflects in her perception of food and health. Since Hiba has a job, her daily life is not all about cooking and housework. Still, it is very significant how important it is to her to guarantee her family a healthy and sufficient diet. She sets great store on healthy, fresh, and clean food in form of vegetables and fruit. This is quite uncommon in Sudan. Even if many women are conscious about the importance of vegetables and fruit for a sufficient diet they give higher preference to meat and oil. For many Sudanese people meat (which is often very fat) is the main ingredient of a good, healthy, and sufficient diet.

Still, Hiba has to follow a number of social restrictions. She would not care about certain traditions and status symbols when it comes to food habits if it was not for having a good image. In that case she has to stick to things like the everyday-tabikh. She would prepare different food (less greasy and oily) if she had not to fulfil the urban traditions. However, she has no choice if she wants to keep the prestige of a good and caring mother and wife and not put shame on her husband. So Hiba sticks to the typical urban middle and upper class food patterns.

12.3 Amel

House and Family

I met Amel's family through Hiba. Hiba's housekeeper is Amel's oldest daughter Amna. They live in Al Regaba which is a quarter in the eastern outskirt of El Obeid. In this area are

living mainly poorer people. They come from the surrounding villages of El Obeid to find work in town especially during the dry season. Furthermore, many war refugees live in this area.

The outer districts of El Obeid are quite different from the rest of the town. For a European it even feels like a change of time when going there. In El Obeid only the main roads are sealed. All the other streets are sandy sometimes thick and deep like the desert and the air is dusty. Most of the houses in town are plastered and to some extent painted. There is some colour in the architecture. In the outer districts the houses are made of mud, clay, or just straw mats. Everything is to be a yellowish brown – even the air. The only colourful spots might be scattered trees, a painted door of a house, an open shop, one of the rare cars, or a colourful tob. The streets are almost deserted. Many walls surrounding properties or even houses have collapsed. Sometimes damages of the houses are fixed with plastic sacks or straw mats. There is not much noise, sometimes children playing, a donkey, a dog, maybe a chicken, or the generator of a shop or mill. Only a few buses go this far and the bus routes end where the outskirt begins[108]. There are no taxis. The shop at the bus stop looks sold out. It not even sells fresh products - it has no freezer or refrigerator because there is no electricity.

The property of Amel and Khalid is very simple. They have a big yard (20x15 m) with three small huts and a small lemon and guava tree. One hut, furnished with two beds, is the 'hall' to receive visitors; the hut next to it is the bedroom with two beds and the cabinet. Both huts are about 2.5x3.5 meters each, just big enough to fit two beds inside and have some space in between to set a siniya. The cabinet is not very big but it contains some nice dishes and pots for special occasions. The third small hut is the kitchen. In front of the kitchen is a shelter with two beds. It is fully covered with straw mats. This is necessary to keep the dust at least a little bit outside and to have some shade. Khalid built all the buildings on his own with the help of friends and relatives. They want to build another house when they have enough money to afford it and to have some more space. The floor in the hut is not sealed as it is not on the whole property. Even if the area is dusty and sandy, the property and the rooms are very clean. There is also a small toilet in the yard, separated through low mud walls. It is just a pit and out of use. The wooden beams, which cover the pit, are rotten. The toilet has been in that condition for several months while already. I asked them what they do if they need the toilet. They just took me across the street, entering the neighbour's house without knocking. There they can use the toilet[109].

Amel and Khalid's property is not connected to the electricity, which is quite normal in that area. If they wanted to have electricity, they would have to install it on their own expense

[108] To reach Amel's and Khalid's house I took a bus to Al Regaba. Where I lived several buses went east but it took quite a while to find one that went so far. It took a 20 minutes bus ride and about 10 minute walk to get to Amel's place.

[109] After we entered the neighbour's place a woman appeared and we had a chat. It seemed totally normal for them to go there and move around freely. This neighbour seemed to be better off. They have a relatively big house, and there were many plants in the yard which were watered. This meant they could afford to use the water for the plants. They were also connected to the electricity, which is very rare in this area.

from the nearest possible connection point. There are some houses in the area with electricity but the network looks rather dangerous. The wires are just put up across the streets and houses sometimes tightened at a mast, finding the shortest way to the official power supply. Electricity is expensive and there are many power cuts in that area. Having electricity in that area is a real luxury.

There is a brand new water tap in Amel's yard. Actually it is just a thin pipe coming out of the ground, at its end a meter and the tap. This was quite an improvement for the family. Before, they had to go to the public pump which is often broken or had to get water from the neighbour. Next to their shelter stand two zeers to store water. They are not very big but since they have a water pipe the supply is much less of a problem now.

Amel (35) and Khalid (35) came to El Obeid about 15 years ago. They used to live in a village near Um Ruwaba (about 120 km southeast of El Obeid). The family had a small farm where they grew groundnuts, roselle, watermelons, and millet. Khalid was studying the Quran at this time and working in the oil factory. Interestingly, Amel pointed out that the main activity of her husband was studying the Quran and like a sideline she mentioned that he worked in the oil factory for edible oil. When the factory was closed in 1990 they moved to El Obeid to find work. Khalid is now working at the vegetable market as a seller. He does not have a stall, but sits on the floor with a few vegetables. Amel stays at home. She has two chickens and one rooster. Sometimes she sells eggs or chicks, but she does not do it herself. Her husband or one of the daughters sell the eggs or chicks for her and give her the money. When they are really short of money she sells charcoal, wood, melon seeds, or groundnuts on the market nearby. Amel and Khalid have six children; 4 daughters and two sons. The daughters are 16, 14, 13, and 6 years old. The two sons are 15 and 7 years old. The two oldest daughters are working as housekeepers. They support the family with their income, giving together SP20,000 per week to the parents for food and daily living expenses. The oldest son does not go to school anymore, but does not really work as well. Sometimes he washes cars. From his money he bought 2 goats as an investment. He does not support his parents with money and his goats are fed by the mother who gives them the kitchen scraps. The three youngest children still go to school.

Food Supply and Kitchen

Amel's kitchen has the size of about 2.5x2.5 metres. Inside the kitchen is one table with several little glasses and containers containing spices, herbs, and ingredients (e.g. salt, pepper, weika, cumin, chilli powder). There is another table where she puts the dishes, pots, and pans and a shelf with a few more containers with ingredients (rice, pasta, flour). All the containers and glasses are relatively small. On one side of the kitchen stands a bed without a mattress which is used for sitting or as a temporary shelf. In the corner next to the door is the cooking space. Here Amel has a kanon, a little table, and a little stool.

The kitchen is well equipped with several pots, pans, bowls, dishes, glasses, cups, and utensils but the equipment is very modest. Amel only cooks on charcoal. She has three kanons of different sizes from a small to a very big one that can carry a kisra plate. Everything in the kitchen is very clean. The little jam glasses containing spices and the pots and dishes are very shiny. I thought, maybe Amel and her daughters had cleaned everything because of my visit.

However, I noticed that while she cooks she wipes the containers she has used before putting them back on the board.

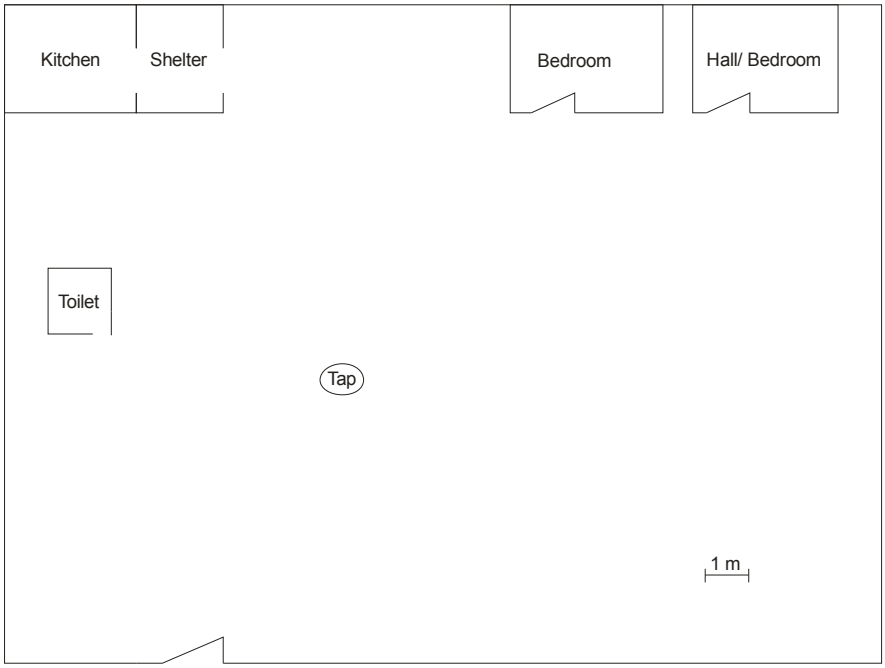

Figure 17: Property of Amel's family

The family mainly buys unprocessed food products like vegetables, fruit, meat, and grains. Even the cereals they buy as grains and take them to the mill or buy it directly from the mill. The mill is just around the corner of Amel's place. It is very comfortable for buying flour, but it also means a lot of noise as the mill has a very old diesel engine. They also buy processed food as well (e.g. pasta, sugar, bread). Most of the food comes from the local market, which is about 2 to 3 km away. The vegetables they buy depend on the season. Tomatoes, pumpkin, okra, and cucumbers are fairly cheap throughout the year. Sometimes Amel also buys fruit like bananas, which are very reasonable, or other fruit depending on the season. Many things like sugar, salt, oil, and sweets they buy at the grocery shop. Ful is also bought from the grocery shop, as homemaking requires too much charcoal and takes too long. At the grocery shop they can buy the food in small amounts. For example, it is too expensive to buy a whole bottle of oil. Therefore, they by it from the shop in a small amount filled in a small plastic bag (about 20 ml)[110].

Sometimes they get oil and samin from relatives living in a village near El Obeid. They grow sesame, roselle, and watermelon and have their own traditional oil mill with a camel. Sometimes they get the oil for free and sometimes they have to pay a little.

[110] This is quite common in households with little income, not only because of the money but also because of the storage facilities. A whole bottle (1 litre) would last quite long and probably spoil in the hot climate very soon.

Amel does the shopping at the market. Every three to four days she goes there. She and her three oldest daughters also do the shopping at the shop. Sometimes when Amel tells them to bring some fresh vegetables the two working daughters do some food shopping on their way home. For example, for my visit the oldest daughter bought some vegetables and meat they usually would not buy. Since she was the one who suggested my visit to her mother she arranged a few things[111].

Usually Amel buys what the money allows. Amel is the one who decides what will happen with the money and what it is spent for. The income comes from her husband's and daughters' work. It also covers daily living expenses, fuel, water, clothes, and school fees.

The family hardly stores any food, since they have no electricity and no refrigerator. Apart from the small containers and tins with spices, sugar, salt, flour, rice, and pasta they have a five-litre bucket for flour. Amel sun-dries okra only. The money is short and they have to calculate from day to day and cannot make bigger investments to buy something for storage. Since weika is a very important ingredient in most dishes Amel always makes sure she has enough at home.

Daily Life and Cooking

It was already 10 o'clock when we arrived at Amel's place and she was already expecting us. She had started to prepare the breakfast because it was about breakfast time. So the aceda was already cooked. I joined Amel in the kitchen after we were introduced to the family present. Since the aceda was already done Amel now made mulah shermout[112]. As I had seen it several times before she used fresh meat cooked it for a few minutes and minced it with the manual mincer. Then she put a pot on the kanon and heated some oil, added half a chopped onion[113], the minced meat, some tomato paste, and let it fry for a moment before she added water, weika, and spices.

After the mulah was ready we made sheiriya. For that Amel melted some samin, added the uncooked spaghetti, sugar, and poured water over it. It is important not to use too much water because it will not be drained when the pasta is ready. So all the water has to be reduced by the cooking process.

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[111] Amna knew what I like to eat. She arranged a few things, which made my visit to a special occasion for the family.

[112] The correct name of this mulah is mulah tagaliya as it is made from fried onions, minced meat, tomato paste, weika and spices. However, it is quite common to call it mulah shermout when it is not very thick and the only change of the recipe is the substitution of shermout by minced meat (tagaliya).

[113] It is always impressing to see how skilled Sudanese women are when it comes to chopping vegetables. They all cut it in their hands and do not use chopping boards. In one hand they hold the vegetable and with the other hand they cut it. They even chop very fine and small pieces that way. Whenever I joined someone chopping vegetables I gave the impression I had no clue how to cook, because I was not able to chop things like this without taking hours for it or making a total mess.

Before the sheiriya was ready Amel sent us to the living room to rest a little before the breakfast[114]. It turned out that we were eating the breakfast on our own. Amel already had breakfast and the children at home were playing. We got our aceda with mulah shermout and sheiriya served on a siniya – but no spoons[115].

When we had finished our breakfast and after some tea, Amel and her 13-year-old daughter Salwa showed us around the house. I was wondering about the noise in the area and they told me about the mill next door. We decided to have a little walk around the area since Amel wanted to clean up and take a rest. We were joined by the three youngest children who were at home because of the summer holidays. It did not take long and we were accompanied by a crow of children. We decided to go to the shop and buy some sweets. It was only a few-minutes walk away but closed. I wondered when it will be open again and was told that no one knows. It is open, when the shop owner feels like opening it or when he has something to sell. The next shop would have been further away – too far to walk - so we had to skip the sweet shopping for the neighbourhood.

Usually there are grocery shops at almost every corner in the towns. But it is not like that in the outskirts. Apart from a low density of shops and markets, the supply is also limited to a few products such as sugar, pasta, rice, tomato paste, oil, biscuits, sweets, and soap.

When we returned to the house, we started to cook lunch. Amel wanted to make some tabikh and geema because of my visit. For the cooking we went back to the kitchen and Salwa, her 13-years old daughter, joined us to wash the dishes and assist her mother. Amel lit the charcoal fire while I peeled the onions and vegetables. Then she started to fry the onions in oil within a small pot and cut meat into pieces and added it. After a while Amel added tomato paste, water, a roughly chopped pumpkin[116], and spices. Salwa was asked to pass ingredients and spices from time to time or to bring water to the kitchen. Then the tabikh had to cook for quite a while.

While the tabikh simmered Amel lit another charcoal fire on the other kanon and gave me potatoes to peel. Amel and Salwa chopped the peeled potatoes into small pieces and Amel fried them with a lot of oil. Then Amel cut some more meat and minced it. This was actually the third dish that day she cooked with meat. So I asked her how often she uses the mincer, she only smiled at me. The minced meat was fried and spiced separately before it was added to the fried potatoes. After we finished the geema and the tabikh was still cooking, Amel decided it was time for a rest. Salwa cleaned up the kitchen and Amel took the small kanon outside into the shelter. When Salwa had finished the cleaning Amel asked her to make us some coffee.

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[114] It is Sudanese tradition to take visitors into the hall to rest a bit and to get out of the sun. But usually these rooms are quite dark and somehow one feels locked away from the life happening outside.

[115] I had to ask for a spoon. I do not mind eating with fingers, but eating aceda with fingers is quite a challenge.

[116] Tabikh garrah (pumpkin) is very common in El Obeid. Pumpkin grows very well in the region and is very cheap. Many households no matter what strata actually make tabikh garrah.

Even though it is nicer to sit in the shelter than inside, the weather was quite a torture. It was very hot and dusty these days. We shook out the bed sheets in the shelter several times because of sand and dust. Even Amel complained about the weather but there was no alternative for escaping from it. Salwa started to make some coffee in a very professional way. She did it as if she had the experience of many years. As I had seen it before the family had a small box with the coffee ingredients in it (coffee beans, different spices, utensils).

While we were sitting there and chatting a small overdressed girl turned up. She was dressed like a doll. She carried a small paper box with different kinds of thing – hair accessories and plastic jewellery. She had heard that I was there and wanted to sell me some of her stuff. Amel felt very embarrassed and wanted to send her away but she just stood in front of me and involved me in a sales talk. It turned out that she was a mate of Amel's youngest daughter. The whole situation got very funny. I did not understand her and my assistants could not translate because they were shaking with laughter. I just wanted to buy something from her to make her stop talking. I bought some of her frilly stuff. But she did not leave and instead took a seat just next to me. She stayed there for a couple of hours.

After we had the nice coffee Salwa made, Amel took the tabikh off the fire and got the biggest kanon and the saj to make kisra. She did it outside in the shelter because she needed some space for it and the kitchen was not big enough. Actually she preferred doing kisra with a wood fire but since she had run out of wood she used charcoal. Amel makes kisra every day. It is the basis of the family's diet. When she makes kisra she starts the fermentation in the morning otherwise it gets too sour. Amel had a five-litre bucket half-full of dough. To make kisra on charcoal fire seemed much more difficult than on a wood fire. The heat was too hot and it took a few sheets until Amel figured out the right amount of charcoal. When the kisra was done she kept a rest of the dough as starter for the next day. Finally, we made some salad from tomatoes, cucumbers, and onions.

For lunch with kisra and tabikh garrah, geema, salad, and bread only Salwa joined us. The two youngest got some tabikh and geema as a bread sandwich and Amel wanted to wait for her husband. We wanted to wait until Khalid and the children came home, too. But Amel insisted that we ate because it may have caused problems for us to find a transport into town later on. It was obvious that it was a special meal for the family. The children enjoyed it a lot. However, it was also obvious that the bread on the siniya was very limited (two pieces broken into four parts). Before we left the family just before sunset Amel served us some mangoes. They usually do not spend much money on fruit but as it was the season mangoes were very reasonable and because of the special occasion Amel bought some for everybody.

The Meals and Special Occasion

Usually the family eats two meals a day: breakfast and lunch. In the early morning they just have some tea before Khalid and the children leave for work and school. The three youngest children come home for breakfast since it is too expensive to let them buy sandwiches. Khalid takes a sandwich with him and the two working daughters get breakfast at their employers' house. The breakfast of the oldest son depends on his daily plans – sometimes he is at home, sometimes he buys something in the town from his own money. For breakfast they usually eat

ful, lentils, tahniya, or salad. Very seldom they eat aceda with mulah for breakfast, if they do so it has to be a Friday or a special occasion.

For lunch they always eat kisra. Very rarely they eat bread because it is too expensive. Whether they eat kisra with mulah, salad, or just some water depends on the financial situation. Usually they have mulah um-rigeiga and sometimes salad. Kisra they have every day and two or three days a week they eat some meat. The family eats lunch after everybody is home. Sometimes the children eat earlier and Amel waits until Khalid comes home. Sometimes the two working daughters get lunch at work and do not eat at home.

The drinks the family has are also very simple. They usually just drink water and in the early morning and after lunch they have some tea but without milk. Coffee they just make when they have visitors. Even if they have all the coffee equipment they just use it occasionally.

There are hardly any special occasions for the family. Friday's food is the same as everyday. Sometimes Amel prepares aceda with mulah if everybody is at home. During Ramadan the food is the same but they just do not eat during the day.

Perception of Food Habits and Individual Preferences

Amel, who is responsible for the family's diet thinks the diet of her family is sufficient. They do not eat what they like or want to. They eat what the money allows. Meat is very important in the Sudanese diet especially in urban thinking as it is available at the market every day. Not to eat meat every day it seen as being poor. Amel's family cannot afford to eat meat every day. This would be the first thing Amel would change if they had more money. She does not have a lot of hope that this will ever change. Even if they sometimes just eat kisra with salad or with water the family does not say they are short in food or suffer from hunger. There is always something that the family can afford but in very hard times Khalid has to lend money to buy food. Asking Amel how a sufficient and healthy diet for her family would look like, she answered they would eat meat and salad everyday. The children said they would like to eat more meat and bread.

Regarding the financial situation of the family there is not much space for individual preferences. For example, the youngest children do not like aceda; they prefer bread but also like kisra. Nevertheless, when aceda is on the menu they eat it. Amel would like to supply the children more with food they like but she has no choice. The children eat the food they get, but they say that they sometime do not like it.

Changes of the Family's Food Habits

There is no big change between Amel's way of supplying her family and her mother's. Asking for the food her mother made and the way she made it Amel said it was the same way and almost the same food. Nevertheless, it became obvious that there was a significant in their food habits after moving to the town – food-wise and lifestyle-wise. In the village they had some agriculture and they even had money from selling crops and from her husband's income at the factory. The life in the village was much easier because for little money they could buy enough food. They used to eat mulah with meat every day. The diet was quiet similar (kisra/

aceda and mulah) to the present one but richer in nutrition and variation. Since there was a dukan in the village they even bought lentils, macaroni, and rice whenever they wanted. Still, there were shortages in the village and sometimes they had to eat kisra with water, but not as often as they eat it now.

Even though Amel thinks life and food in the village was much better they would never go back for several reasons. The family says the living standard in the town is much better than in the village. They have a water pipe in the house now. Furthermore, the services are much better. It is not so far to a hospital, the children can go to school, and it is easier for them to find a job after they finish school. Even if it is no qualified work, at least they can raise some money. Khalid would find no job in the village either. In the town they have three incomes. However, life in town is much more expensive and they need the three incomes very much to sustain their livelihood.

Conclusion

Amel is the one who is responsible for her family's diet. She makes the decisions of how much money is spent, what is bought, what is cooked, and prepares the food. The food habits of Amel's family are determined by the financial situation of the family. The money is very little and five adults and three children have to live on three low incomes. The decision about the dishes cooked is almost taken on a daily basis depending on the money available. Even if Amel does the big shopping on the market about twice a week she only buys everyday things like grain, fuel, rice, pasta, sugar, and spices – stuff that is easy to store in amounts that will last a few day. When they have meat, vegetables, or even fruit depending on the budget, Amel asks her daughter to bring it from the market on their way home. They also usually bring some bread.

All the cooking is done by Amel with the assistance of her 13-year old daughter. Her duties are mainly to pass ingredients, get water, and to clean the dishes. Also she makes coffee and tea. This might also be done by the oldest daughters in the morning and one Fridays. The cooking is Amel's sphere who controls and carefully deals with the limited resources. Usually the family has a very simple diet so the preparation does not take too much time. For visitors Amel always prepares something special. In that case she spends much more time and money on cooking.

The living conditions and the food habits of the family are also restricted by the area they live in. The food supply system (shops, markets) is limited and gives not much choice of good offers or saving opportunities. Amel has to buy food she can get and afford. The next market is quite fare away, so transportation has to be paid or it is a long walk.

Amel tries to make the diet of her family as healthy, sufficient, and variable as possible but usually they have to eat ful, kisra with a thin mulah, and salad. Even if the living and food situation in the village was better, the family has no alternative to living in town. The village does not give any perspectives concerning the education of the children and the income of Khalid and the grown-up children.

12.4 Lubna

House and Family

Lubna was the housekeeper in the place where I lived in El Obeid. She came in the morning several times a week to clean the place, cook food, and sometimes doing some laundry for us. Whenever she came she spread good mood. She was very excited about me staying there and kept inviting me to her house.

Lubna (45), her husband Ahmed (46), and three of their five children live in Wadelas which is a quarter west of the town centre and within second circle of the cluster of El Obeid. The area has a good supply of shops and has a small market which is about 1 km away from their house. The area is also connected to the public transport which serves the main road not far away from the house. It takes about 10 – 15 minutes to reach the town centre by bus. In this area the strata are mixed and it cannot be generalised which income group is mainly found. People of all kind of strata live door to door. Many people living in that quarter are not originally from El Obeid but have been living there for a certain time; in many cases in the second or third generation already. This also applies to Lubna and Ahmed. Both of their families are originally from the area near Um Ruwaba. When they got married they moved to Khartoum where Ahmed worked as a policeman. After he stopped working for the police about 15 years ago they came to El Obeid, because Ahmed found a job there as carpenter.

Ahmed still works as a carpenter and Lubna works as housekeeper and washerwomen. They have five children; three daughters (25, 16, and 14 years) and two sons (21 and 7 years). The two oldest children are students in Khartoum and stay there with relatives. Even if the parents do not have to pay for the living expenses of these two children they have to pay for the university and send them some pocket money to cover their daily expenses. The three youngest children live at home and go to school. Due to the summer holidays they all were home at the time of my visit.

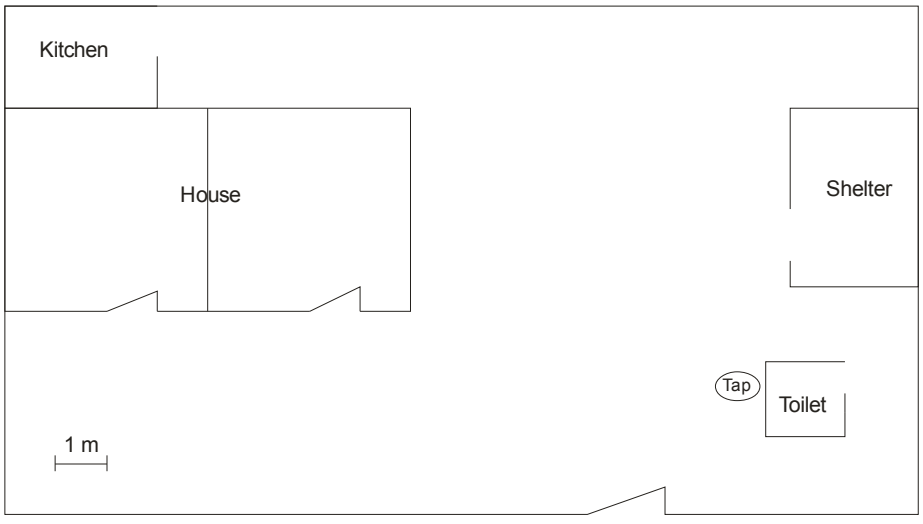

Figure 18: Property of Lubna's family

The family's property has a size of about 18x10 metres. Their house is just a simple unpainted and unplastered mud house of about 8x4 metres. It is separated into two rooms – the parent's bedroom and the hall where the children sleep, when they do not sleep outside. In the bedroom is a cabinet with nice dishes, glasses, and cups. Lubna also keeps plenty of pots of different size there (up to a very big one). The kitchen is behind the house. They also have one shelter of about 2.5x3.5 meters. Three beds, some chairs, small tables, and a zeer are placed in it. The toilet is a pit hole in the ground, surrounded by walls made of straw mats. The floor of the whole property except the house is not sealed, it is the pure sand.

The property is connected to electricity but they hardly use it because it is too expensive. They only have one plug in the bedroom. They have one water pipe in the yard which is the only water connection of the property. Lubna has a small kitchen garden where she grows two bushes of tomatoes and some rilja (*Portulaca oleracea*), as well as a few flowers. Near the shelter she also grows some flowers, sunflowers, and a cotton bush.

Food Supply and Kitchen

Lubna's kitchen is more of a shelter than a solid house. It is placed between the back of the house and the corner walls of the property just covered by a straw roof. The fourth wall is just a straw mat which does not cover the whole front leaving some space as door. The kitchen is not very big (about 2x3 metres) but the little yard in front of the kitchen is also used for cooking and storing the two kanons and some pots and containers for the daily use. Lubna has several pots, pans, dishes, tools, and utensils. Furthermore, she has an electric blender to mash for example tomatoes. She keeps this in the bedroom since there is the plug. If she wants to use it, she has to use it there. If they have no electricity, she sometimes goes to the neighbour's house to use it there. The equipment is simple but she has all kinds of cooking equipment which is needed for the many different kinds of dishes. The family has no refrigerator. If they want to cool something, they take it to the neighbour who has one. Lubna has a two-flame gas stove but it ran out of gas quite a while ago. Now she uses the kanon and wood fire only. Cooking with the kanon takes much longer and is very hot, but Lubna has no choice since they cannot afford a new gas bottle.

To make her kitchen more comfortable Lubna has put up a few pictures of her favourite singer on the wall. This decoration marks the kitchen as Lubna's personal room. It is her space and she wants to have it nice and comfortable. When I asked her why she does not put up the pictures in the bedroom, she told me that these are her favourite singers and not her husband's. Moreover, she does not want to have pictures of other beautiful women in her bedroom, which might 'irritate' her husband. She prefers to have the pictures in the kitchen where she can see them as she spends a lot of time there.

On two shelves in the kitchen Lubna has several glasses and small containers with spices. She likes to have the right spices for different dishes at home even though the family's food supply mainly depends on the financial situation. Moreover, they do not have much space to store food. Therefore, they mainly rely on fresh food like vegetables and meat. Lubna only stores some products like flour, pasta, rice, and sugar which are kept in closed buckets and containers.

Most of the food is bought on the market in the area and at the grocery shop in the corner. What is bought and when depends on the money they have. The second daughter, Sarah, does most of the shopping after school or in the morning during the holidays. Fresh vegetables, meat, fruit, flour, rice, and spices she buys at the market about every second day or when certain things are needed. The kind of vegetables and fruit she buys depends mainly on the season. She buys vegetables, which are reasonably priced, and fruit only when they can afford it. Bananas for example are always quite cheap so they buy them several times a week. Small things which might be needed urgently such as sugar, salt, oil, and tomato paste the children buy from the nearby grocery shop. Usually Lubna also brings some food from the central market which she has to pass when she comes from work. However, she just buys food there when she knows that it is needed or when she sees a good offer. She also buys bread and kisra on her way home. Lubna does not make kisra herself, as it is too expensive needing so much charcoal or wood and especially, too much time. Therefore, she prefers to buy it[117].

The money spend on the food shopping in Lubna's family comes exclusively from Ahmed's income. He also has to cover all other living expenses such as charcoal, electricity, water, clothes, health service, and education. Even though it is Ahmed's income which is spent for food, Lubna decides what is bought as she also decides what is cooked. Sometimes Sarah takes over some responsibility and decides what she will buy. This does not mean that she disposes the money for food she wants. She is aware of the financial situation and knows what will be on the menu. Lubna does not have to tell her every time what and how much to bring. Sometimes she even buys something Lubna forgot to tell her. Expensive ingredients like oil and tomato paste they only buy in small amounts at the shop. This is not only a question of the price but also of storage room. Bigger amounts of oil or open cans of tomato paste would spoil in the hot climate very easily. Food like rice, flour, and pasta is bought and stored in amounts that might last about a week. Sometimes when the money is short they even buy these things on a daily basis or every second day.

Even though Lubna has her own income she does not spend it on food. It is her responsibility to pay for the kitchen equipments. She also spends it on cosmetics and perfumes for her own use. Lubna does the laundry of some neighbours and sometimes they bring her gifts in form of food (kisra, some fruit, or sweets). This does not happen often but from time to time.

Moreover, Lubna stores some sun-drying food, such as meat (shermout), okra (weika), onions, and sometimes tomatoes. Shermout, weika, and dried onions are very important for many daily dishes and Lubna always makes sure she has some at home. She usually dries the amount that might last one or two weeks. If she has some money left, she might buy some more meat, okra, and onions to dry bigger amounts. Lubna does not mind to spend time and effort on the drying process and usually her daughters help her.

[117] Kisra is usually sold by women in the streets, at the market, or in their homes. Some women sell their kisra to a shop who will sell it to the customers with little profit. All the kisra sold in El Obeid is homemade and an important source of income for many women. But they cannot make a lot of profit from kisra, because it needs the dough, fuel, and time to prepare it.

Daily Life and Cooking

One day when I arrived at Lubna's house it was already late morning. Since I lived at the other end of the town it took almost one hour to get there. I had to take a bus to the central market and then another bus to get to her house. This was actually the way Lubna travelled every day she came to our house. Lubna did not want me to come too early because she had to do some laundry for her neighbour in the morning. When I arrived at her house the breakfast was almost ready cooked by her daughter Sarah. She heated up the ful, using the kanon in front of the kitchen. And before we had breakfast Lubna showed me around her home.

As Lubna had been working in the morning she had left Sarah responsible for the kitchen. She had prepared the whole breakfast of aceda with mulah rob and shermout, sheiriya, ful with salad, falafel, and bread. Ful, falafel, and bread were bought at the shop by the youngest daughter but the main dishes - aceda with mulah rob, mulah shermout, and sheiriya - were homemade. The aceda was made from sorghum feterita, a cheap variety. It also fills the stomach very well and makes strong, Lubna explained to me. Feterita gives the aceda a greyish colour which does not bother the family. For the rob Sarah used sour milk. Lubna likes spicy food, therefore she prepared some chilli made from fresh green chilli, cut into small pieces, and pounded with some pepper and salt. Actually she always serves a little spice plate containing salt, pepper, chilli powder, and cumin with every meal, no matter if they have visitors or not. As the three youngest children were at home we all had breakfast together sitting around the siniya in the shelter. After the breakfast the two daughters disappeared in the kitchen to clean up and to prepare some tea. The washing up was done in front of the kitchen. Since there was just one water tap in the yard the girls had to carry buckets of water to the kitchen. While the youngest daughter was doing the dishes I helped Sarah making the tea. I had another good look around the kitchen and Lubna explained all the spices to me.

Sarah prepared the tea very professionally. Lubna said, most of the time Sarah does the tea as she herself works all day. Therefore, her daughters helped a lot in the kitchen and with the housework. Lubna makes the tea in the morning, but the rest of the day and when they have visitors Sarah prepares it.

As I knew Lubna's working habits from our house, it was interesting for me to see her daughters doing some housework. They did it the same way as their mother did; including the way they moved. It was obvious that Lubna totally trusted especially Sarah. She did not check her work, but had a close eye on her youngest daughter, correcting her from time to time which annoyed her when she did it in my presence.

After the kitchen was cleaned and the yard was swept we all had some nice tea. Then Lubna got a kanon and some charcoal to the shelter and asked me to light the fire. In the meantime she started to prepare onions, meat, and some pumpkin to cook tabikh garrah. When the charcoal was ready Lubna put a lot of oil into a big pot, added the chopped onions, fried them for a few minutes, and added the chopped meat which she also fried for a while before adding water. After a while she added some mashed tomatoes she had prepared before. As she used the electric blender she had to do it in the bedroom. Making tabikh in the shelter is not usual. Normally Lubna cooked in front of the kitchen. Since I was there, Lubna cooked in the shelter

me to be able to watch it and sitting in the shade at the same time. Lubna said she finds cooking on the kanon much more comfortable than on a gas stove. Even if it is much hotter and takes longer, she can sit next to it. When using the gas stove she has to stand while cooking.

While the tabikh cooked for a couple of hours we were sitting in the shelter with a close eye on the cooking pot while chatting. I asked the youngest son to get us some cold soft drinks. We drank some of these and then the son brought the bottle to the neighbour's house to put it in the refrigerator. While we were chatting and the girls had a rest in the shelter more and more neighbours came to visit Lubna. The news that Lubna had a foreign visitor had spread like a bush fire. In the end it got really crowded in the shelter as 6 neighbours were visiting. The girls did not have a chance to get some rest.

Lubna is very famous for her coffee. It is common that some neighbour women stop by when she is home in the afternoon to drink some coffee. Therefore, everyone brings some ingredients. Some bring sugar, some coffee beans, some sweets, and some dates. No one will show up without a little present and share. Sometimes they come and check out what is missing and then get it. While we were sitting in the shelter Lubna started to make coffee, by roasting the beans. For that she and Sarah got the second kanon, a tray with small coffee cups, and the box with the coffee ingredients and utensils. After the beans were roasted in a small pan, Lubna ground the roasted coffee using a mortar. The Sudanese mortars are wooden. From the frequent use for all kind of grinding (pepper, garlic, okra, onions, shermout, sugar, coffee) they usually turn their colour almost to black. Commonly a heavy metal stick with a diameter of about 3 cm is used as a pestle for a powerful pounding. When Lubna ground the coffee, she used a certain rhythm of grinding and hitting the pestle inside the mortar so the coffee sticking to the pestle would fall of. The rhythm of pounding and the clinking of the mortar and pestle made some kind of music or rhythm that infected all people present. So we all took cups and glasses or just clap our hands and joined Lubna's 'coffee sound'. After that Lubna added the coffee powder and some cinnamon bark and ginger powder to the boiling water and in the end everybody had a small cup of coffee, some sweets, dates, and a lot of chatting. Then suddenly a man turned up. It was Lubna's neighbour and his wife was already with us. He took a chair and joined us in the shelter. It seemed to be no problem that he joined all the women because they knew each other well. So they all just pulled their tobs up, to cover their heads but also stopped the chattering. He said he was passing by and smelling the nice coffee he could not resist. He got his extra glass of coffee with an extra amount of ginger[118] in the company of all his female neighbours and the foreigner.

After the coffee session and when all the neighbours had left we returned to cooking the lunch. Lubna finished the tabikh by adding the pumpkin, some more tomato paste, and spices. Sarah and I prepared the salad and boiled some rice. Meanwhile Lubna's youngest daughter washed the dishes from the coffee break. When the lunch was almost ready the neighbour from opposite turned up – she was the wife of the man who came for the coffee. She brought

[118] Sudanese men prefer to drink coffee with a lot of ginger because they believe it will support and strengthen their virility.

some homemade kisra and some tabikh bamia. For one she brought it for me since she wanted me to be her guest, too and of course invited me to her house. Moreover, this food was her extra contribution for the coffee her husband drank.

By the time the meal was ready and served it was almost sunset and Ahmed came home from work. Therefore, Sarah quickly prepared another siniya for Ahmed and the youngest son. The lunch contained two kinds of kisra (the one from the market and the one from the neighbour), tabikh garrah and tabikh bamia, salad, rice, and bread. The two kinds of kisra gave a good impression of how different kisra can be. The kisra from the market was white and the taste not very exciting; it was very mild and hardly had a sour taste. By contrast the homemade kisra was grey and had a stronger sour flavour (it actually was made from feterita)[119]. As dessert Lubna cut up some mangoes and bananas.

After lunch I left to go home. When I passed by the neighbour's house – the one who brought the food - she wanted me to stay longer. It was already late. So I stayed for just a bit until all the friends from the coffee party showed up and accompanied me to the main road to find a taxi home.

The Meals

The family usually has two meals a day. During the week they all have some tea and biscuits before they leave the house. For breakfast the children take a sandwich to school, Ahmed has breakfast with his colleagues and Lubna also has breakfast at work. Lunch they eat quite late at about 6 p.m. when Ahmed gets home. This is the main meal of the day and it is very important for them to have it together to discuss things and exchange information. The meal is served by Lubna or her daughters on a siniya where they all eat from the same bowls and plates with fingers. This also includes the aceda. Many urban families eat aceda with a spoon because it is, in a western sense, quite messy to eat with fingers[120]. For lunch they always sit in the yard. Sometimes when it is very hot or when they eat earlier and need some shade, they will sit in the shelter. The meal is eaten together if there are no visitors. Otherwise they eat separated by male and female at the same time. Depending on the number of people they will then sit in the yard and in the shelter or hall. Normally for lunch they will eat aceda with mulah and salad. Sometimes they will also have ful, tamia, or even tabikh depending on the money. In that case Lubna will prepare it. This she might do at home or using the kitchen at work. Usually they have meat every day at least in form of shermout or some pieces of fresh

[119] It is quite typical that market kisra is made from white sorghum otherwise it would not sell. Many town people prefer white cereal products (including kisra and aceda) which are hardly fermented. It does not bother them that these white and slightly fermented products hardly have any flavour.

[120] Eating aceda by hand shows some traditional mentality. There are many urban people who think when eating with fingers, only the finger tips should be used. Using the whole hand to form the food for eating to them is very rural and uncivilised. This opinion mainly applies in Khartoum. By contrast in El Obeid many families still eat with the whole hand. This can be explained by their diet. In El Obeid it is much more common to eat traditional dishes like aceda or kisra with mulah which are very hard to control just using the finger tips. But these dishes have almost disappeared from the cuisine in Khartoum where people in most middle and upper class households prefer bread and tabikh which can be much easier eaten just with the finger tips.

meat in the mulah. In this family it is very common to eat a lot of aceda and kisra. For all meals they also have some bread but it is not more important than the other food. Aceda and kisra are understood as the basic food.

The family does not have supper they just have some tea with milk at night. The main drinks of the family are water, which comes from the tap or is stored in the zeer. Moreover, they drink tea. They usually do not drink soft drinks, because they are too expensive and they have no refrigerator to store them.

Special Occasions

Special occasions and the celebration with special food are very limited for Lubna's and Ahmed's family. Sometimes when they can afford it Fridays are special in order to eat meat or tabikh. However, on Fridays usually the food of the family does not differ too much. Since they are all at home they have breakfast together. Lubna will do all the cooking assisted by Sarah. For breakfast at about 10:30 a.m. they usually eat aceda with mulah rob and sheiriya. Sometimes when the can afford it they eat ful and tamia, too. The lunch is similar to weekdays but sometimes Lubna makes tabikh, salata aswad, stuffed vegetables, or even meat. Since meat is expensive Lubna uses groundnut butter instead of meat for the stuffed vegetables. They also eat earlier at around 4 or 5 p.m. on Fridays therefore they might have a light meal (rice, thin porridge, ful) at night as well.

Even during Ramadan the food is not special. Since they already stick to traditional food, which is eaten by many urban families during Ramadan, their diet does not change apart from fasting during the day.

When they celebrate special occasions they will save some money in advance to have a feast with all kinds of dishes which belong to an urban celebration. This only happens once in a few years. While I was in El Obeid they celebrated the circumcision of the youngest son. The preparations took several days including getting new clothes for the son and a lot of cooking. My housemates and me actually put together to give the family some financial support for the feast. With the help of the neighbours Lubna prepared several dishes a couple of days in advance and bought a lot of sweets and dates to have a big feast.

Perception of Food Habits and Changes

Lubna is quite satisfied with the diet of her family. Even if they do not have a lot of money they always have enough to eat. Surprisingly, the whole family even the children like aceda a lot. According to Ahmed he does not have to eat anything else than aceda. Nevertheless, the family would prefer to eat more meat and they would like to have tabikh more often. As tabikh is never eaten with aceda they would eat kisra or bread for lunch. Preparing tabikh would instantly mean a bigger effort and more time spent on cooking and automatically would change the diet drastically as tabikh requests for other and additional dishes.

The present food habits of the family are quite traditional (aceda with mulah). Nevertheless, the family members show a great willingness to change their diet to a more urban style with dishes such as stuffed vegetables, geema, and kufta if they had enough money. They actually

think a diet containing oilier and fatty food as well as more meat is healthier. At the moment they consider their diet as rural. Still, they would not necessarily move away from traditional food like aceda and kisra, because they like it a lot. They even prefer it to bread which they find tasteless and not giving any strength.

The diet of Lubna's parents has been much better than hers today because the father was wealthy owning livestock and chicken. Her parents lived in a village near Um Ruwaba and had a little plot where they grew some cereals and vegetables and had a big number of chicken, goats, and some sheep. They ate meat almost every day. Furthermore, her mother was a very good cook so Lubna prepares the food exactly the same way as her mother did. According to Lubna the diet of her parents differed only that they ate more meat. They also ate mainly aceda or kisra with mulah for breakfast and lunch. Urban dishes like mashi, geema, and kufta were not common at all. These are dishes only for special occasions in Lubna's family. If she had a choice, it would be everyday or at least Friday's food.

Conclusion

Even if Lubna is working and the cooking during the week is done by her 16-year-old daughter Sarah, Lubna is the one responsible for the family's diet. She decides what is bought and prepared. For an outsider it might look like Sarah is responsible for the cooking but a closer look shows that she carries out her mother's decisions. Even if Sarah takes over an important role and a lot of responsibility, the kitchen is still Lubna's domain. This becomes obvious when Lubna is home. On these days she does the cooking and Sarah takes over the role of her assistant. This also applies in case of more complicated dishes, which are exclusively cooked by Lubna. Even though Sarah says she could cook tabikh it is always prepared Lubna whenever they have it. Moreover, the kitchen is Lubna's 'room' as she has put up some pictures of her favourite singers and not Sarah's (she laughed when I asked her). Nevertheless, when it comes to the preparation of daily food, Lubna does not need to worry because Sarah does it very well. Since the family cannot store any food for the next day without a refrigerator they have to cook every day freshly.

As Sarah prepares the daily food this might be one reason for the simple diet of the family. Another one is the restricted financial situation. They do not consider their diet as insufficient because they eat food they like. In that case the family found a good way to be satisfied with their meals even without a big choice. If they had more money, they would consume more meat and change to urban dishes from time to time. Nevertheless, such a change might not be very significant because the urban cuisine includes more time-consuming and complicated preparation. Lubna's time is very limited but she is the one who always prepares the urban dishes. Sarah prepares the simple daily meals. It is doubtful if Sarah has the skills and the time to prepare urban dishes. Even though she could, it is questioned if Lubna would let her prepare these dishes as this would mean a loss of domain for herself.

The diet of the family is traditional and when they have no visitors the meals are simple compared to urban standards. They usually eat aceda and mulah, salad, bread, and sometime some ful for breakfast and lunch. Tabikh and other urban dishes are only prepared for special occasions.

The income structure of the close neighbourhood varies strongly. But this does not play any role in the social community as the families maintain a strong neighbourhood network. The frequent coffee parties at Lubna's place are just one example for the social coexistence. It is common that the better-off neighbours support the others for example by offering storage place in their refrigerator, helping out with electricity, or making little food gifts. The other way around Lubna or her daughters help the other neighbours with the housework or the laundry. This is only little everyday support by the families of the neighbourhood but it is a strong social network, which has also worked in times of crises.

12.5 Mona

House and Family

I was introduced to Mona (60) and her family by her daughter Fatima, who was a student at the University of Kordofan. Mona's family has lived in El Obeid for many generations. The family's ancestors have been working as government officials in the town. So did Mona's husband who died in 2000 from malaria.

Mona has eight children (5 daughters, 3 sons) who are all adults ranging from the age of 21 to 40. Apart from three of them all the others live in her house. Her oldest son is married and lives in Khartoum. He and his wife have no children. One of her daughters lives in Khartoum, too. She is married and has children. Another daughter is unmarried and lives in Saudi Arabia.

Mona's oldest daughter (36) is married and has twins who where just 7 months old the time I visited the family. She and her husband have a small building on Mona's property which has just two rooms where the small family lives. Mona's four other children live in her house which has four rooms, one hall, a kitchen, and a bathroom.

Mona never had a job. She has been a housewife since she got married and now gets a little widow pension. The main income for Mona and her children comes from her oldest son in Khartoum. He has a very well paid job and since he and his wife have no children he supports his mother, sisters, and brothers. The daughter in Khartoum does not support the mother a lot because she has her own family but the daughter in Saudi Arabia sends some money from time to time. Mona's oldest daughter and her husband both work for the Zakat Ministry. This is enough for them to live of it. As they have the twins they give money to the mother only sometimes. The other children living at home also have their share. The two daughters are both working as computer programmer in the finance ministry and her two youngest sons, who are still students, earn some money through the family shop. So generally, the main income is guaranteed by the oldest son in Khartoum but all the other children somehow support the family.

Several times a week a housekeeper comes to Mona's house. She does the laundry and some cleaning in the house. She is not invited to the meals but sometimes, depending on her stay, she gets some food like a sandwich.

Their house is located just west of the town centre. The central market is less than a five-minute drive away. The house is one of the old houses which have been there for a long time.

Though it is quite old it is nice and comfortable. The main house with its four rooms, the hall, the kitchen, and a small bathroom is very solid. It is plastered and painted. The little brick house of her daughter's family is not plastered or painted and was built a short time ago to add some living space. The property has only the one kitchen in the house, so it is used by Mona and her daughter's family. The toilet is outside in the yard surrounded by a high brick walls. It is not connected to the sewage system. Nevertheless, it has a lavatory pan and is and the floor is properly cemented. The house is connected to electricity and also to the water network. As the supply is very unreliable the family has a several barrels to store water. The kitchen has no water connection but still they have water in the house (shower) and a tap outside.

Figure 19: Property of Mona's family

At one of the corners of the yard is the little grocery shop the family runs. The shop belongs to the family but they have rented it out to someone. However, they complain that he is not doing a good job. So actually Mona's two youngest sons take care of the business.

Food Supply and Kitchen

Mona's kitchen is very well equipped. They have a big refrigerator with a freezer standing in the hall, a four-flame gas stove with an integrated oven, an electric blender, a pressure cooker, and plenty of pots, pans, dishes, buckets, containers, as well as three kanons. In the cupboard and on the shelves are several buckets and containers with food and ingredients as well as kitchen tools and utensils.

Though having a well-equipped kitchen, Mona hardly uses it. She prefers to sit in the yard behind the house and does most of the cooking outside. This way she uses the kanon for cooking and can sit on the bed doing so. She says it is to exhausting for her to stand when she cooks. She prefers to sit next to the kanon and when the food simmers or she feels tired she just lays down for a rest. Hence, for cooking she brings all the ingredients she needs outside and uses the kanon to prepare the food. The gas stove is mainly used by the daughters. They say, cooking with gas is much more convenient, faster and cleaner even if the cooking has to be done inside.

Most of the food used are unprocessed products. They also use processed food like tomato paste, pasta, bread, and oil. The main shopping is done at the central market once or twice a week by Mona's second son since he is the oldest male family member at home. He also buys the charcoal at the market. The gas comes from the family shop which is organised by him as well. The other children do some shopping at the market, too. To go to work or university they have to pass the market and if they see something that might be needed or they like to eat, they buy it. At the market they buy all the fresh foodstuff like vegetables, fruit, flour, meat, and spices. Furthermore, they get food from their grocery shop. As they own the shop they get all other food like pasta, wheat flour, rice, sugar, salt, and oil from there. All family members including Mona go to the shop. The income spent for food mainly comes from the son in Khartoum. Nevertheless, the three working daughters spend their money for food shopping too.

However, Mona still is the one who controls the family's money and decides what is bought. Even if her daughters do some shopping, Mona tells them what to bring. Sometimes they bring something Mona did not tell them, because they like it or it is a good offer but all the basic and needed food is under the control of Mona who does the main cooking for the family.

As they have a refrigerator with a freezer all the food that can spoil in the hot climate is stored in there. When they have fresh meat they usually put it in the freezer. Vegetables, cheese, yoghurt, fruit, and milk are kept in the refrigerator. For making kisra Mona also keeps some starter in the refrigerator. Food that will not spoil like rice, pasta, flour, beans, and sugar is kept in covered buckets and containers on the shelves and in the cupboards in the kitchen.

Furthermore, Mona does some traditional sun-drying of meat, okra, and onions. Meat she actually only dries when the weather is very hot, so she receives a shermout of high quality. If the temperature is not high or the air not dry enough, the meat might spoil or get rancid. The drying is done occasionally to make sure there is always some weika and dry onion in the house. If Mona has no shermout, she just uses minced meat instead. This she minces herself.

Daily Life and Cooking

Once I was invited by Mona on a Friday. She wanted me to come on a holiday when her daughter Fatima and her other children were home. Fatima picked me up at 9 a.m. to take me to her place. Since I lived in the east of town and Mona in the west we had to pass the central market and took this opportunity to do some shopping. Mona had told Fatima to bring some meat and some grapefruit. As it was a Friday things were very relaxed and the breakfast was planed for later because it was going to be big[121].

When we arrived in Mona's house I was asked to have a seat in the hall. And shortly after that I was served water[122], cola, and sweets. While I was sitting in the hall, next to the big old cabinet filled with old exclusive dishes, Mona's children stopped by to welcome me. After I had finish my drink I was released from the welcoming ceremony and Fatima showed me around the house and explained the picture of the family to me. Mona was already sitting in the yard behind the house. They had permanently put up a big straw mat as roof to provide some shade. In that kind of shelter Mona sat on a bed in front of a kanon and a pot with mulah rob on it. Next to her stood a tray with all kind of ingredients on it. In the corner of the yard was another bed where her other daughter was sitting, washing the dishes. The mulah rob was already cooked and Mona started to prepare mulah shermout which actually was mulah tagaliya. For that she fried some chopped onions in oil and then pounded it in the mortar. Then she took some fresh meat, cut it into pieces, and minced it in the manual mincer. Mona prefers minced meat to prepare mulah shermout[123] because it is much faster to cook. Still, she uses dried meat if she has any, because this is the traditional, the 'real' way of making mulah shermout. Mona fried the minced meat in oil added some tomato paste, water, spices, and in the end the fried mashed onions. While Mona was cooking the mulah on the kanon, Fatima and I went inside and started to cook aceda on the gas stove. Fatima took white sorghum and wheat flour equally and mixed it with water to make dough. The wheat, Fatima said, is important to make the aceda soft and to give it a brighter colour. She did not ferment the dough because the family prefers it that way. They do not like the sour taste of fermented aceda and they think it is much easier to digest if unfermented[124]. Fatima told me that they sometimes make aceda from millet and wheat. Especially, during Ramadan and when they have guests from Kordofan or Darfur as they prefer millet. But millet aceda is very heavy – too heavy for a typical urban breakfast with many different dishes. Furthermore, aceda made of millet is not as soft as aceda made of sorghum or wheat. Even though we cooked the aceda on the gas stove we used the hollow aceda pot because it is easier to stir. Usually Mona prepares the aceda but as Fatima was at home she helped her mother. This is a big mark of confidence.

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[121] Actually all meals on Fridays are very big and extended in middle and upper class households. Sometimes it is quite a battle to deal with all the food eaten that day.

[122] Water is not considered as a drink in the Arab culture. Of course it is a thirst quencher but it is not understood as a drink to offer; it is a staple. It is normal to supply everybody with water but when it comes to offer a drink, water does not count.

[123] See reference 112

[124] I had heard a lot of people complaining about heartburn from fermented or strongly fermented aceda before.

Usually the older women of a household cook aceda as they are the most experienced. Mona, letting her daughter preparing aceda for a guest means that she trusts her to do it in the same quality as she would do. When the aceda was cooked we filled it into two metal bowls and put it aside to cool down. Then we went outside to see how Mona was doing. She had finished the mulah and started to prepare the meat (*sheia*). First she grilled the whole pieces of meat for a moment. Then she cut it into small pieces. The chopped meat she put into a wok-like pan with some oil and spices and fried it until it was ready.

After that Mona put on her tob and went outside to the shop to get some eggs, pasta, and cheese. While Fatima and I boiled the eggs and then were preparing the pasta to make sheiriya, Mona washed the dishes outside. She only uses the kitchen sometimes for things like boiling eggs or ful, the latter in the pressure cooker. Fatima and I heated some ful which was already cooked on a previous day and prepared some salad. Mona set up a big siniya for breakfast and another small one for her son who was working in the shop that day. On that siniya she only put food he likes – ful, eggs, and sheiriya. Since it was Friday it was already late (about 11 a.m.) and her son had come into the kitchen several times to see if the breakfast was ready. He was hungry, and finally was successful and took his breakfast with him. The youngest son was not home. He had gone out to meet some friends. Therefore, Mona, her two daughters and me had the Friday's breakfast together. It was a big breakfast with aceda and mulah rob and tagaliya, sheiriya, ful, sheia, eggs, salad, and bread. Mona's married daughter joined the breakfast a little later. Her husband was not home either. As it is very common to have the Friday breakfast with friends, he actually had gone to the mosque and would have breakfast at a friend's house.

After breakfast we all took a little rest. Although we already had a long cooking session the main food preparation was about to come. The Friday lunch is very important for the family because this is the day when they are home and visitors might come for lunch. After our rest Mona went out to visit friends and left the kitchen to Fatima and me. Fatima put some chicken in a pot, added water, and spices and let it boil. I peeled the potatoes for making geema. We chopped the potatoes into small pieces and fried them in a lot of oil until they were soft. In another pan Fatima fried some minced meat, then adding some water. This she let cook for a while until most of the water was reduced and added tomato paste and spices. The spices (fresh garlic and pepper) I had crushed in the mortar. When the minced meat was ready we added the fried potato pieces, let it cook for another while until the geema was ready. Next Fatima decided to make salata aswad (fried eggplants with groundnut butter). We chopped the eggplants and Fatima fried them in a lot of oil. When the eggplants were soft and had absorbed as much oil as possible still a lot of oil was left in the pan. Fatima mashed the eggplant pieces and added some tomato paste, spices, lemon juices, crushed garlic, and groundnut butter. After cooking it for a moment the second dish was ready. In the meantime the chicken was ready and Fatima took it out of the stew. After we had finished the cooking her sister cleaned the dishes in the yard. By that time Mona came back and made coffee. Friday coffee is a family tradition I was told. As they are all home on Fridays this is a good chance to sit together and chat. Mona made the coffee the traditional way by roasting, grinding, and boiling it. She also had her tray with all the ingredients on it (coffee beans, spices, pots). As we were

quite a number of people Mona made a lot, so there was plenty for everyone. Since the male family members were not home yet, all the women sat together and had a nice break with spicy coffee. Before sitting down Mona had brought one cup to her son who was still working in the shop. This coffee break was more of a female gathering but they assured me that the sons would join them if they were home.

After the coffee break Mona made some kisra. She had already prepared the dough in the morning. When her husband was still alive she used to make kisra every day for lunch because he liked it a lot. Now she only made it on Fridays. Though even on Fridays they sometimes buy it at the market when she is too busy or tired. Mona actually does not mind not having to make kisra every day. It saves her some time she says. As she spends most of the day cooking anyway, she is pleased about everything she does not have to cook. After Mona made the kisra Fatima heated some tabikh, already prepared a previous day and I chopped some tomatoes and cucumber for the salad. Then we prepared some fruit salad for dessert and set the tray for lunch. Having kisra and tabikh khudra (*Corchorus olitorius*), salata aswad, geema, chicken, salad[125], and bread is not a very big lunch. Keeping in mind the big breakfast and the oil content of the lunch (we used about 1.5 litre of oil for cooking) it is quite a lot to eat. We had lunch at about 5 p.m. and Mona's son had closed the shop and had gone out as well. So it were only the female family members and me again who had lunch together. After lunch we all needed a rest from all that cooking and especially from the big amount of food we had. A little later we had tea which Mona had made and ate the dessert and then rested some more before I left just after sunset prayer.

In Mona's house all kinds of different typical Sudanese and urban dishes are prepared. Even if the daughters prepare many different dishes, Mona still is in control of everything that happens in the kitchen. It was obvious that Mona makes all the decisions concerning the diet of the family. This also concerns the whole family life. As Mona's husband passed away, she is the head of the family now and makes the final decisions on all family businesses. Even though all her children are grown ups. During the week Mona does all the cooking on her own as her daughters are working. Still, the daughters help a lot when they are at home. Especially Fatima does a lot of cooking on Fridays to support the mother.

The time spent on cooking depends on the day and the occasion. Mona does not cook whole meals every day. Of course there are some dishes she makes every day such as salad, but the dishes like tabikh, sheia, geema, mashi, or kufta she only prepares when they run out of it or they like to eat it. For example, on Saturdays Mona cooks ful for the whole week and puts it in the refrigerator. The other main dishes she cooks every second or third day in larger amounts which last a few days. Even though Mona does not cook every dish everyday she says she spends most of her time with food preparation. There is usually one dish they ran out of, so she has to cook it again to make sure the refrigerator is always filled. When the family

[125] The salad at breakfast was cut in small pieces and oil was added. For lunch it was cut in big pieces without oil. Fatima said they do it that way because in the breakfast they might not have enough oil with the other dishes but in lunch the other dishes contain enough oil.

expects guests Mona prepares fresh food and usually makes aceda for breakfast and kisra for lunch.

During the week Mona also does the dishes and cleaning after cooking, but when her daughters are home they do it. This also applies to the preparation of drinks. Tea and coffee are prepared by Mona or her daughters because usually they drink it when they sit together.

Mona also prepares the food for her oldest daughter and family. This does not mean she prepares them extra meals, but they have full access to the prepared food in the refrigerator and when they eat at the same time they join the meal. Still, her daughter makes food for her husband too if he likes to eat something special or different.

The Meals and Special Occasions

The members of Mona's family have three meals a day; breakfast, lunch, and supper. In the early morning they have some tea with milk and biscuits. Since everybody is leaving the house in the morning, apart from Mona, they eat breakfast out. Mona who eats at home usually has ful, eggs, or cheese with some salad and bread. Sometimes her sister comes along to join. During the week the family usually does not eat the lunch together either. Everybody comes home at a different time, so everybody just prepares him-/ herself a sandwich with meat, ful, geema, salata aswad, stuffed vegetables, or whatever can be found in the refrigerator. There is no fixed lunchtime. Everyone eats when coming home or being hungry. For supper they usually eat ful, tamia, or agashé[126] as a sandwich or just have some milk or rice pudding. Usually everybody takes supper whenever she/ he wants to. So the family does not have supper together either. Nevertheless, if Mona's sons want to eat a warm sandwich they do not heat the filling (e.g. ful, tabikh) themselves, they actually ask Mona or one of their sisters to do it for them.

When it comes to the food habits of Mona's adult children they show a quite western behaviour. The family does not eat many meals together because of the different daily activities. Also their way of eating is not traditional at all. During the week they do not sit around the siniya. They just make a sandwich by filling bread with a dish. Only on Fridays or holidays they return to the traditional way of eating. On Fridays the family usually has breakfast together. They eat ful, sheia, eggs, salad, aceda with mulah, and sheiriya. They like aceda a lot and enjoy it for Friday's breakfast. The Friday's lunch is eaten together as well. They see it as special family event. They usually eat tabikh with kisra, meat, geema, mashi, salata aswad, kufta, salad, and bread. However, even on Friday it happens that not all of them sit together. It seemed to me that their Friday's coffee party is more important than the collective meal.

When the family has guests or on special occasions they also return to the traditional eating habits. The meal is served on a siniya and people gather around it. Depending on the visitors they eat separate by gender. Especially during Ramadan they attach great importance to tradi-

[126] Speciality made from meat from West Africa. The meat is cut into thin pieces and grilled on a stick covered in spices and crushed groundnuts.

tional food and the way of eating. For the fast breaking they always have aceda made of millet with mulah as main dish. Again the women eat together at home while the men take some food and eat outside with other men.

Perception of Food Habits, Individual Preferences, and Changes

Mona's family is very satisfied with their food habits. They have in their own opinion a quite modern and progressive way of having the meals even if they stick to typical Sudanese town dishes. Mona thinks that the way her children eat is not very healthy but she is also proud that they all live a modern life like young people in Sudan should do. She supports them in their lifestyle by providing them with good Sudanese food, even if they eat it in a very untraditional way. At the same time Mona tries to keep up the Sudanese traditions on Fridays and holidays. The eating habits give the working and studying members of the family a lot of freedom and flexibility. Mona does not mind that she has to do all the cooking during the week because she is very proud that all her daughters are working and two of them even studying at the same time. Her children appreciate Mona's efforts and they think it is very important to stick to traditions at least on holidays. Traditions and the traditional way of eating are important for them to keep the family together. Nevertheless, they would not like to refrain from their modern way of life. For all of them it is important to keep up with time, which includes food.

It is obvious that the children already have totally different food preferences compared to Mona. For example, they do not like kisra and prefer bread. Mona likes kisra a lot but her children say bread is much better. Maybe bread does not taste very exciting but is very convenient. Bread can be eaten with everything. Kisra and aceda only go with mulah or tabikh; not with ful, cheese, eggs, geema, meat, or jam, so they told me. With bread they can eat everything and it is much easier and faster to make a sandwich than when eating kisra or aceda. Furthermore, aceda and kisra have to be prepared freshly whereas bread can just be bought all day and be eaten straight away. They do not mind eating aceda and kisra but not as everyday food. According to them it is just not as modern as bread.

One preference all share is unfermented aceda made from a mixture of sorghum and wheat flour. The share of wheat is quite high which is typical urban. The higher the portion of wheat, the softer the aceda. Mona's family also prefers a white sorghum variety to give the aceda and the kisra a bright colour. Even if Mona makes aceda from millet for special occasions she uses a higher share of wheat than millet to make the aceda soft. Many urban people prefer soft and white aceda as rural people prefer darker (grey or yellow) and very stiff aceda. Some even say, from the softness of aceda you can tell if the people are urban people or just migrants or rural people.

Changes of the Family's Food Habits

The changes of the food habits in Mona's family are obvious. The family has lived in El Obeid for many generations and they always followed the urban traditions. However, the norms, rules, standards, and preferences have changed over the generations. For example, Mona's parents used to eat aceda for every breakfast even if they already ate ful and tamia

too. For lunch they always ate kisra with tabikh sometimes with mulah. They already ate some bread but it was never as important as it is today. The staple food was always aceda and kisra, with a lower wheat content than in Mona's aceda today. Another important point is that the whole family used to eat all meals together.

When Mona's husband was still alive they used to eat kisra everyday and ate lunch and supper together. Aceda was mainly eaten for Friday's breakfast. Additionally the number of served dishes was less. The most significant changes in the food habits occurred when Mona's children had grown up. They prefer bread to kisra and eat individually their sandwich instead of a shared meal. Bread compared to kisra or even aceda gives them much more freedom and flexibility in what, where, and when they eat. For them bread is the symbol of freedom for what they call 'a modern, working town citizen'.

With the changing lifestyle the food preparation also changes. While Mona still uses a kanon, her daughters prefer the gas stove. Even though they know how to prepare traditional dishes, they only do it when they have time. Would the mother not cook for them, they would only eat food that does not require so much preparation time. This already shows in the preference for bread instead of kisra and aceda and minced meat instead of shermout. Of course the children like the food their mother cooks but they themselves would never spend so much time preparing it.

Conclusion

Mona's family is one of the old-established families of El Obeid who have lived there for many decades. They belong to the families who have been working in official jobs and as civil servants for many generations. Their whole lifestyle is adapted to the urban area and so is their food. They prefer the typical urban cuisine which is a combination of traditional rural dishes and traditional urban dishes which mainly come from the Turkish, Egyptians, and Arabs. The dishes are rich in energy and protein (meat, oil, pulses) and need a lot of ingredients and time to be prepared.

Even if the family sticks to the traditional town food their way of eating is strongly determined by their daily activities. As all of Mona's children are grown ups and working or studying the importance of the daily meals as such decreases. During the week the family mainly eats sandwiches and hardly have a meal together. This is limited to Fridays and holidays. The daily meals have to fit into their individual schedules. For that they prefer something they can eat quickly. On Fridays and holidays or during Ramadan the family follows the Sudanese traditions and eats together.

Nevertheless, the food preparation is still traditional because it is the responsibility of Mona. She decides what is bought, how much money is spent, and what is cooked. Even though Mona has a kitchen with a modern stove she prefers to prepare the food the traditional way on a kanon. She has no hurry to get the food prepared and she wants to do it in a relaxed way. She thinks it is more comfortable to sit on a bed in the yard in front of a kanon instead of standing in the kitchen all day. By contrast her daughters who also cook on weekends or holidays prefer to cook with the stove because it is faster. Since Mona supplies her adult children

with meals, the family shows a combination of traditional urban food preparation and a modern way of eating. However, there is one thing that has not changed yet: the fact that Mona or her daughters prepare the meals – the kitchen even in this family is still the domain of the women.

12.6 Zuheir

House and Family

I met Zuheir through one of my assistants. Zuheir is her family's washerwoman who comes to do the laundry once a week. Zuheir and her family live in the outskirt of El Obeid and my assistant told me that they are actually from the area near Nuba Mountains. The family lives in Al Regaba where Amel's family lives too. It is a big area in the east and northeast of the town. The bus going to Al Regaba ends south of the area – closer to Amel's places. The area where Zuheir lives is further north and even harder to reach by public transport. As El Obeid is not that big and the university is in the northeast, it is possible to walk to this area of Al Regaba. As already mentioned, Al Regaba is an area where mainly poor migrants are found. They come from the surrounding villages to find jobs in the town. Especially during the dry season many temporary migrants live in impermanent or insufficient housing. Furthermore, war refugees from South Kordofan and Nuba Mountains live in this area. Zuheir and her family are among them.

The family came to El Obeid about 15 years ago with very few belongings and some money. They used to live in a village near Al Lagowa in South Kordofan. Zuheir and her husband owned a little farm. They had a few goats for milk and were growing their own food as well as some crops for the market. They used to go to the market twice a week. Her husband had bees and sold honey on the market of Al Lagowa. Zuheir herself sold some of the crops like watermelon, sesame, groundnut, courgettes, and sorghum. She sold the surplus when they needed money to buy things like sugar, rice, salt, and spices.

They came to El Obeid because of the civil war. Zuheir's husband was killed in the war and she came to the town with her three daughters to stay with relatives in El Obeid. One year after her arrival she got married to Abdulla, who is a relative of hers and they moved to their own place.

Today Zuheir's (50) three daughters are 30, 18, and 16 years old. Her youngest daughter still goes to school and her two other daughters do not work. Her oldest daughter has three children on her own (7, 3, 1.5 years) and they live with Zuheir. There is no father to the children or a husband who supports them. The family only lives on two incomes. One is Zuheir's who works as a housekeeper and washerwoman and sometimes sells eggs. The other income is that of Abdulla (55) who works as porter at the market, carrying commodities, loading up and unloading lorries. Both are working on Fridays too because the family needs the money.

Zuheir's and Abdulla's house is very small. The yard has a size of about 10x7 metres. The surrounding walls are very old and low mud walls. On the property is just one mud hut of about 3.5x3 metres and in front of it a shelter of about the same size. The house is just big

enough to accommodate two beds and a narrow corridor between it. It also accommodates a very old and small cabinet where Zuheir keeps a couple of nice glasses, some dishes, bowls, and pots. The shelter is made of wooden beams covered with straw mats and old sugar sacks. There stand two other beds, two chairs, and an old stool-like table. Next to the shelter is the place where they store the water in two old oil barrels and one zeer. In the opposite corner is the kitchen which is just a low mud hut of about 2x2 meters. The roof is made of branches covered with an old cloth. It is not even high enough to stand inside (about 1.4 m). The house is rented and the rent is very expensive for the quality of housing. They have to pay SP20,000 a month which is about one quarter of Zuheir's monthly income.

The property is not connected to water. They get water from the neighbour or have to collect it from the pump. The pump is about a five-minute walk away from the house. These public pumps are the main water infrastructure in this area but unfortunately they are quite often broken. Furthermore, Zuheir's house has no electricity. In this area only a few houses are connected to the electric network. The property also has no bathroom or toilet and they use the one of the neighbours who are a little better-off. Zuheir and Abdulla are not allowed to make any changes at the house as it is not their own property and the landlord is very strict. In the yard Zuheir has a bush of lubia (cowpea), cotton, and grows some peppermint. The lubia bush does not carry enough beans to feed the family but brings a little extra food. Zuheir also keeps four chickens.

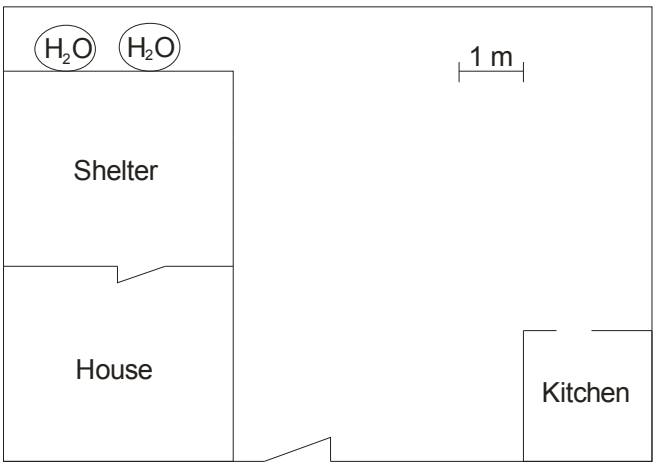

Figure 20: Property of Zuheir's family

Food Supply and Kitchen

The Kitchen only contains two cardboard boxes as cupboards where the family keeps some ingredients like rice, pasta, tea, and spices in little glasses and plastic bags and some dishes and equipment for daily use. The flour is kept in an old metal bucket. The cooking equipment is very modest with some plastic cups and bowls, two small buckets, and a couple of small pots of different size and shape as well as a small plate to make kisra. Furthermore, they have some equipment like a wooden stirrer, some spoons, a manual mincer, and a mortar. The dishes and pots are kept in the small cabinet in the house with the better dishes. Even the bet-

ter dishes are not very new but at least there are some extra bowls, plates, cups, and glasses. The zeer is covered with a piece of metal and a metal mug stands on it, so everybody can drink from it. The family has no gas stove which is too expensive to buy. All cooking is done on one kanon or in case of kisra on a wood fire. The kanon is very small and Abdulla made it out of an old metal bucket. It is quite common that Sudanese reuse plastic bottles, containers, and even oil or petrol canisters in the kitchen. In this household the majority of the storage equipment or containers were reused receptacles.

The food supply of the family is very simple and depends very much on the daily income situation. They mainly buy unprocessed products such as vegetables (tomatoes, okra, onions, cucumbers, potatoes), meat, sorghum flour, rice, and some products like pasta, tomato paste, groundnut butter, and oil but hardly any fruit. The sorghum flour is from feterita because it is the cheapest. Furthermore, they use salt, pepper, cumin, and weika. The food mainly comes from the little market in the area which is about 2 km away from the house. There they also buy wood and charcoal. There is one dukan nearby (about 500m) but it is not open regularly. They only do shopping at the shop when there is an urgent need and they have money for it.

The shopping is done by the three daughters since Zuheir and Abdulla are working every day. They do the shopping every day. The money supply of the family is so small that they cannot buy bigger amounts of food for several days. The only food they buy in advance is flour, rice, pasta, tea, sugar, and some spices. All the other food like vegetables or meat is bought on a daily basis. Sometimes, if they have some extra money and Zuheir passes by the market she buys some food too. Since both incomes are very small the money of both, Zuheir and Abdulla is spent on food and living expenses. As other households show a priority for using the male income for food and living expenses it is not the case in this household.

Even though the oldest daughter does most of the cooking, Zuheir decides what is bought. She gives her daughters the money and tells them what to buy. As the shopping is determined by the available money the shopping list is very monotonous. Normally they buy some tomatoes, onions, okra, oil, groundnut butter, and bread. Even the oil is bought in small amounts (about 20 ml filled in a small plastic bag). When they have a little more money Zuheir tells her daughters to get some meat, potatoes, and tomato paste too. The wood and charcoal for cooking are also bought by the daughters. They buy it about twice a week but it also depends on the money available. If the money is very little, the family eats salad or groundnut butter and bread only and does not cook any food.

They do not store any food for long. Most of the food is bought daily and eaten directly. They have no possibility to store fresh food since they have no refrigerator or enough space. Zuheir and her daughter only dry some okra or sometimes even meat in small amounts. If they have some extra money, they prefer to buy meat to make some mulah instead of increasing the amount of food.

Daily Life and Cooking

As finding Zuheir's house is rather difficult she came to my assistant's home near the university in the morning and picked us up. The weather was too hot and dusty to walk, and Zuheir

had already walked all the way into town. Therefore, we decided to take a taxi to Zuheir's home. I felt guilty because I knew that Zuheir was working everyday and usually did not take a day off. But she told us she was going to work later in the afternoon that day.

When we came to her house it was quite busy with her three daughters being at home and the three grandchildren playing around. Firstly, they showed me around the house and the neighbourhood. As Al Regaba seemed to be even hotter and dustier than the rest of town, we sat down in the shelter and chatted a bit. Zuheir's youngest daughter took three nice glasses out of the cabinet and disappeared in to the kitchen. A few moments later she came back with the glasses on a tray, filled with an orange drink which turned out to be some instant powder orange juice. This drink already gave me the first impression of the water quality in that area[127]. Apart from the instant powder and dark particles the drink also contained something that was moving around. I got in a little trouble explaining why I could not drink that juice. This juice really did not look like something a European digestive system could deal with. It was obvious that Zuheir and her daughters wanted to give us a special treat but after one of my assistants explained to them why I could not drink it, Zuheir's grandchildren seemed to be happy to get some juice.

Then I went into the kitchen with Zuheir's second daughter who was going to make kisra. First I was surprised that she was doing it inside the kitchen because the smoke of the fire can be very annoying. However, the wood was very dry and did not make a lot of smoke. I also realised that is was much cooler in that little mud hut than outside. She sat down on a low stool next to the fire and placed a siniya next to her for the baked kisra. There was not much space left for me to fit into the kitchen. As another stool would not fit inside and the roof was to low to stand I just stood outside to watch her. The dough and equipment to make kisra was in the kitchen and I only got her some water from one of the barrels. She lit the fire and placed the kisra plate on four stones over the fire. When it was hot she rubbed some oil out of a can on the saj with a piece of cloth. The dough was kept in a small bucket and the daughter had prepared it the previous night so it could ferment over night. With a small bowl the daughter took some dough and poured it on the plate, spread it quickly with a lot of skill, and a moment later the sheet was ready. She placed the kisra on the siniya and in between the kisra sheets she dipped the gergeriba and the bowl into the water so the dough would not stick to it. It took about half an hour to finish the dough. A rest was left as starter for the next dough. Then she wrapped kisra on the siniya into a thick plastic foil, put the fire off, and scrapped of the sticking pieces of dough from the kisra plate.

Under the kitchen roof hung a plastic bag with tomatoes, some pieces of bread, and another bag with some onions, a few okras, and a little meat. Zuheir's second daughter took six tomatoes and cut them into small pieces really quickly added a little oil, salt, and pepper. She put the bowl with the salad on a small siniya, broke four pieces of bread into half, and added them on the tray. That was our breakfast. She carried it outside into the shelter and we all had

[127] The water quality in El Obeid is not very good. Especially in the outskirt and during that time of the year of very hot (40 °C and more) and dry weather many people get diarrhoea from bad water.

breakfast together. The three grandchildren did not eat with us as they already had some breakfast (bread with groundnut butter) earlier that day. As there was not much bread Zuheir had put three spoons on the tray for us so we could eat the salad with spoons when the bread was finished[128].

When we had finished the breakfast, Zuheir's two youngest daughters washed the dishes and we had some rest in the shelter and chatted some more. It did not take long before neighbours stopped by to say 'hello'. As we were already seven adults sitting in the shelter it got crowded after a while. After we had distributed some sweets which we had brought with us, we decided to take a little walk around the area. We passed the water pump where some children where playing and the closed shop. The rest of the area was deserted and most of the houses were small and many walls and huts had been collapsed.

When we came back from the little walk Zuheir made mulah um-rigeiga ('thin mother'). Usually all the cooking is done in the small kitchen as the kitchen tools and equipment, as well all ingredients are stored in there. Since I was there to join, Zuheir cooked in the shelter. She lit the charcoal fire in the kanon and set a small pot filled with water on it. She peeled and chopped one onion and put it into the boiling water. Then she chopped the little bit of meat and put it in the pot as well, adding some salt. The amount of meat was not more than 200 grams including the bones. It was cow's meat[129] with a lot of tendons and fat. To stretch the mulah because it had to be enough for 5 adults and 3 children, Zuheir added some oil and more water. As it was just a small amount of sauce it cooked very fast and Zuheir did not need too much charcoal. After a while she chopped a few okras, crushed some fresh garlic in the mortar, and added both as well as some pepper to the stew. This had to cook for another while but after about one hour the mulah was ready. As they cannot afford many ingredients and only small amounts of food are cooked the preparation of these simple dishes does not take a lot of time. So for Zuheir and her daughters the time spent for the daily meal preparation might range from two to three hours or even less depending on the dishes. The girls said that the shopping takes almost longer than the cooking since they have to walk all the way to the market and back. The food preparation is done in the morning before breakfast and just before lunch and is mainly done by the two older daughters of Zuheir. The youngest daughter only assists. When Zuheir is at home she does the cooking, but usually she works at the time the cooking is done. Zuheir also makes the tea in morning, as she gets up first and wants to drink some tea before she leaves for work.

As we knew that the family did not have a lot to eat we had told Zuheir we would not stay for lunch even before we went to her house. Therefore, after all the cooking and chatting we left. We decided to walk back to university or grab a taxi if we found one. However, there was no taxi on our way back and we walked all the way which took about 45 minutes.

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[128] Actually, we wanted to bring some salad and bread with us, when we went to Zuheir's house but she insisted not to. It would have been offending to her because it would look like she was not able to serve guests.

[129] Cow's meat is cheaper than goat or sheep. Even if many Sudanese prefer sheep they eat cow because of the price.

The Meals and Special Occasions

Zuheir's family eats two meals a day, breakfast and lunch. In the early morning they drink some tea with sugar but do not eat biscuits. Very rarely they buy some powdered milk for the tea (powdered because they cannot store fresh milk). Her daughters and three grandchildren eat breakfast at home. When the financial situation is a little better they eat aceda with mulah for breakfast but usually they just have some groundnut butter or tomato salad and some bread. Zuheir and Abdulla eat breakfast at work. Zuheir usually gets some food at her working place but Abdulla has to buy something.

For lunch they usually eat kisra with a thin mulah (um-rigeiga) or with salad. Sometimes they also eat some pasta or rice in addition. If Zuheir or Abdulla earn a little more money, they might even buy some potatoes as addition to the kisra and mulah. Zuheir gets her salary, she usually buys meat to prepare a nice mulah. The daughters and grandchildren eat lunch at about 2 p.m. because of the children. Zuheir and Abdulla eat lunch when they come home which usually is between 4 and 6 p.m. They eat what the family has left over. They do not eat any supper or drink tea at night because it is too expensive to light the fire just for some tea.

All meals are served on the siniya and they eat with fingers. Since Zuheir and Abdulla are working it is not very common that the whole family eats together. Usually the daughters and grandchildren eat lunch and breakfast together and Zuheir and Abdulla eat lunch together. Having visitors who stay for a meal is very uncommon as they could not really afford it. Hence, they do not eat separated by gender.

There are not really any special occasions the family celebrates. Zuheir and Abdulla work even on Fridays so there are no special meals. Very seldom they might prepare aceda with mulah, sheiriya or salabiy for breakfast or a thicker mulah for lunch when everybody is at home. Also during Ramadan and at holidays they have no special meals. For the family these are just days like any other apart from maybe fasting during the day. Urban traditions and norms such as serving tabikh and certain number of dishes for holidays and to visitors cannot be regarded since the family has to make sure everybody (especially the children) gets enough to eat.

Perception of Food Habits and Changes

The diet of the family is very simple, monotonous, and not sufficient. The way Zuheir and her daughters talk about their diet is not very happy. It is not uncommon that they do not have enough to eat and are hungry for days. However, as long as they know that there will be better days occasionally and the children have enough to eat, they do not complain.

If she had more money, Zuheir would offer her family more meat or even three meals a day. She actually thinks that the biggest deficiency in the family's diet is the lack of meat. Meat is very important in the Sudanese food culture. Someone who does not eat enough meat is seen as poor. Zuheir thinks the same way. For her the first step to improve her family's diet would be to increase their meat consumption and not the amount of staple food or number of meals. This is quite interesting because when she lived in the village in South Kordofan she was very

satisfied with her family's diet even if they had meat on holidays or for special occasions only.

Their life in El Obeid does not offer any room for individual preferences. They have to eat what the money can buy. Hence, Zuheir does not care if the family sticks to any social rules and norms concerning their food habits. She has more serious worries. For her it is just important to feed the family somehow. Nevertheless, it is important for them to stick to religious rules.

For Zuheir and her daughters the food habits have changed most obviously when they had to move to El Obeid. In the village they always had enough to eat, even though they only had two meals a day as well. The food they ate had much more variety even if they ate aceda with mulah every breakfast and lunch. They grew different vegetables and could make different kinds of mulah (lubia, groundnut, shermout, rob, bamia, weika). They did not have to pay for their staple food as they grew it themselves. The life in town is expensive and they have to pay a rent. Their diet is very monotonous as they cannot afford to buy different kinds of vegetables and cannot eat what they want. Sometimes they not even have enough money to cook a meal at all. If they had a choice, they would still eat aceda and mulah for every meal. However, they had to change to kisra because it can be eaten with more reasonable side dishes which might not have to be cooked (e.g. salad, water). Therefore, the change of food habits was forced by the low income and the higher living expenses in the town.

If it were possible, they would like to go back to their village. They still have a plot there, but Zuheir says it is not save to return yet. Furthermore, they stay in El Obeid because Zuheir wants her youngest daughter to finish school and wants the possibility for her grandparents to go to school which would not be possible in their village.

Conclusion

The diet of Zuheir's family is very moderate and limited by their income. Their housing, way of food preparation, and the kind of food they consume reflects their poverty. Their property and house interior are also very moderate. The five adults and three children have to share 4 beds. Their interior mainly comprises some clothes and kitchen equipment only. Because of only two low incomes the family has no possibility to plan their livelihood on a long run. They have to live from day to day and there is not really a perspective for improvement. As they cannot afford to buy a lot or different kinds of food, the food preparation concentrates on a small number of dishes like kisra, thin mulah, and salad. The food preparation of most dishes is very simple and apart from kisra or aceda does not require many skills. Moreover, not much time is spent on food preparation as there is not much to prepare. Zuheir's two oldest daughters are in charge of the food preparation most of the time because Zuheir works every day of the week. Still, Zuheir controls the money and decides what is spent. She is the one who decides what is bought and how much money is spent on food.

Even though they would eat more aceda and mulah too if they had more money, they would increase the meat consumption (in form of mulah) first. Apart from the bread, which might be eaten with groundnut butter or salad, the family's food habits do not have any urban charac

teristics. Dishes like tabikh or ful do not belong to the menu of the family because they are too expensive.

13 Present Eating Habits in El Obeid from a Cultural Ecological Perspective

13.1 Urbanisation in Sudan

13.1.1 Urban Population Growth

Worldwide, especially in developing countries, the urban population is rapidly growing (Brown and McCalla 2005, Coy and Kraas 2003, Nelson 1999, Maxwell et al. 2000, von Braun et al. 1998). Between 1950 and 1975 the world's urban population doubled from 733 million to 1,518 million (United Nations 2006). During that period the urban population in Sudan rose even more than the fivefold from 579,000 to 3,231,000 (United Nations 2006). From 1975 to 2000 the urban population of the world increased a further 89 per cent to 2.86 billion and probably will reach almost 5 billion by 2030 (United Nations 2006). In Sudan the urban population increased to 11.87 million until the year 2000 and is expected to be at 32.8 million by 2030 (United Nations 2006). While in the 1950 more than 90 per cent of the Sudanese population lived in rural areas today it is only about 60 per cent. It is estimated that in the near future at least half of all Sudanese will live in urban centres and the population in rural areas will be stagnating or maybe even declining (Table 6).

Table 6: Urbanisation Trends of the World and Sudan (according United Nations 2006)

	World					Sudan				
Year	**Total population ('000)**	**Urban population ('000)**	**Rural population ('000)**	**% urban**	**% rural**	**Total population ('000)**	**Urban population ('000)**	**Rural population ('000)**	**% urban**	**% rural**
1950	2,519,470	732,974	1,786,496	29.1	70.9	9,190	579	8,611	6.3	93.7
1955	2,757,399	852,556	1,904,844	30.9	69.1	10,250	828	9,422	8.1	91.9
1960	3,023,812	993,521	2,030,290	32.9	67.1	11,513	1,186	10,327	10.3	89.7
1965	3,337,974	1,159,063	2,178,910	34.7	65.3	12,963	1,691	11,272	13.0	87.0
1970	3,696,588	1,331,023	2,365,566	36.0	64.0	14,699	2,408	12,291	16.4	83.6
1975	4,073,740	1,518,425	2,555,314	37.3	62.7	17,056	3,231	13,825	18.9	81.1
1980	4,442,295	1,739,826	2,702,469	39.2	60.8	19,970	3,986	15,984	20.0	80.0
1985	4,843,947	1,989,845	2,854,102	41.1	58.9	23,382	5,230	18,152	22.4	77.6
1990	5,279,519	2,280,119	2,999,400	43.2	56.8	26,066	6,938	19,128	26.6	73.4
1995	5,692,353	2,564,960	3,127,392	45.1	54.9	29,352	9,201	20,151	31.3	68.7
2000	6,085,572	2,863,982	3,221,590	47.1	52.9	32,902	11,884	21,018	36.1	63.9
2005	6,464,750	3,177,456	3,287,293	49.2	50.8	36,233	14,775	21,458	40.8	59.2
2010	6,842,923	3,511,834	3,331,089	51.3	48.7	40,254	18,194	22,060	45.2	54.8
2015	7,219,431	3,867,755	3,351,677	53.6	46.4	44,035	21,700	22,335	49.3	50.7
2020	7,577,889	4,236,446	3,341,443	55.9	44.1	47,536	25,174	22,361	53.0	47.0
2025	7,905,239	4,610,560	3,294,679	58.3	41.7	51,031	28,887	22,145	56.6	43.4
2030	8,199,104	4,986,617	3,212,487	60.8	39.2	54,511	32,806	21,705	60.2	39.8

13.1.2 Migration as Driving Force for Urbanisation

The high rate of urbanisation in Sudan is mainly a result of migration from rural areas. The reasons for moving to urban centres are various and often many factors coincide. Many rural people leave their villages because of the adverse economic and environmental conditions[130] (Hussain 1991, Theis 1999). The farming activities and subsistence production often cannot cover the total demand of the household. Even if the household produces enough food an additional monetary income is needed to cover other living expenses (e.g. clothes, health and education service, taxes). However, the income generation opportunities in rural areas are very limited and in many cases the agricultural productivity decreases because of worsening environmental conditions. The expansion of the mechanised subsector does not provide sustainable job opportunities and subsistence farmers are marginalised to even worse grounds. The politicians have neglected rural areas for decades. Lacking infrastructure and employment opportunities lead to even harsher conditions. Rural people more and more depend on the monetary income because subsistence farming alone cannot secure their livelihood. If this income cannot be generated and the livelihood cannot be secured in the rural environment, people migrate temporarily or permanently to urban centres hoping for an income and better living conditions (Beall et al. 1999, Grawert 1994b, Hussain 1991, Rheingans 1994, Theis 1999).

Apart from economic reasons the migration to urban areas might be motivated or forced by political factors. Because of ongoing violent conflicts people of the affected regions are forced to migrate (Grawert 1994b). Rural people who are forced out of their traditional natural and social environment and are robbed of their livelihood basis tend to migrate to towns as their access to new agricultural land to establish a new rural existence is very limited. Another political factor increasing urban migration is the neglect of rural areas and preferential treatment of urban centres which makes towns and cities more attractive to many people. The urban biased politics of the Sudanese government gives the impression that the Sudanese elite sees urban life as something more desirable while rural life, especially unsettled lifestyles, are despicable and depreciated. Rural people may also have to migrate to towns because of political and economic decision establishing large–scale farms on the expense of small-scale agriculture.

Moreover, people might migrate because of voluntary motivations. In many regions it is a tradition for young men to work in towns for a few years to earn money, to gain live experiences, or to get education. Spending time in urban areas away from home young men have to prove themselves, their family, and their home community that they can handle the challenge and live in a kind of independence. This increases the esteem of the person and its family.

[130] Droughts often make rural people to seek relief in urban areas. Even if this is named as natural cause for migration it actually is a man-made and political problem. Urban biases, political neglect of rural areas, and too little or no action by and relief through public authorities in times of crises force people to leave their home and migrate to urban areas with better economic living conditions.

Bigger towns and cities are often more attractive to young people as they offer not only job opportunities, a better infrastructure, and education, but also cultural and entertainment facilities (Rheingans 1994). Often men migrate firstly but many women follow their migrated husbands (Beall et al. 1999, Hesse 2004, Klein-Hessling and El-Sammani 1994, Rheingans 1994).

The case of El Obeid shows clearly the different motivations for migration. The development of the town during the last few centuries depended largely on migrants. Migrants came from various parts of Sudan as traders, government employees, and workers in formal jobs. In addition, nomads and local farmers have been coming to El Obeid for many decades as temporary or permanent residents because of economic reasons and of worsening living conditions in rural Kordofan. Especially during the dry season many rural men or even whole families migrate to El Obeid to find paid work. Not all of them return to their villages for the rainy season to pursue agricultural activities. Another big group of migrants in El Obeid are refugees from areas of violent conflicts.

The consequences of urbanisation are as various as its causes. The way of living in towns and cities is very different to rural areas. While in rural areas the access to land, labour, and agricultural input is essential for the agricultural production to secure the livelihood, the income in urban life is almost exclusively monetised. To secure the livelihood the access to employment and income generating activities is essential (Ay 2005, Beall et al. 1999, Rheingans 1994, Theis 1999). There are a many opportunities to generate an income which is needed to access the possibilities and structures of towns (market supply, social services, infrastructure). Nevertheless, in many cases it is very likely that social and economic contrasts become more critical in towns. Especially when the household income is very low its members have only limited access to urban privileges.

Migration to urban centres also means a change of the social structures of the individual. Even if it is very common in Sudan that migrants move to places where they already have relatives (Klein-Hessling and El-Sammani 1994) the migrants have to establish or integrate into a new social network. The urban networks might not be as close as in rural areas since the interdependence within the social unit is less. The daily life of the people is much more focused on the survival of a household or individual as the community spirit is not as intensive as in rural communities. The new social situation and structures are often a big challenge in securing the urban livelihood.

13.1.3 Rural – Urban Interaction

Urbanisation is a process which takes place into two directions: the migration from rural to urban and the return of migrants and spread of urban habits to rural areas. The increasing urbanisation and outflow from the rural areas has serious economic and social effects for the rural communities. Working migration is a male domain since it fits into the existing social structures (Grawert 1994c). Apart from the loss of the male work force and the increase of the female labour burden in households experiencing migration of family members (Grawert 1994c, Myers and Hamid 1994, Myers et al. 1995a, Teherani-Krönner 1997, 1999) the whole

social structure of the community is affected[131]. Furthermore, the changing food patterns in urban centres and the increasing demand for certain food like edible oil, vegetables, fruit, and meat results in a shift of the agricultural production. Rural households can grow cash crops instead of staples to serve the urban markets because their grain requirements can be satisfy through the expansion of the mechanised subsector. This leads to a change of the production system and a higher dependence on a monetary income of the rural household (Beall et al. 1999, Theis 1999). As the market also offers new products this might also create a new demand for non-local products. The increasing dependence of rural households on the market supply is also strengthened by urban behaviour, patterns, and commodities which are carried back into the villages by returning migrants (Beall et al. 1999, Dirar 1993, den Hartog and van Staveren 1995, Theis 1999).

13.2 The Cycle of Meal – Influences and Food Preferences in El Obeid

13.2.1 Market Supply and the Demand for Food Products

By contrast to rural areas in towns and cities there are hardly any opportunities for the households to produce their own food[132]. Therefore, the urban population depends on an income and the market supply. The urban markets might not offer every traditional and seasonal product but the range of commodities is much bigger and seasonal fluctuations are not as significant as they are on rural markets. The market infrastructure within El Obeid is strong and offers a big variety of commodities. Apart from seasonal products from the region or national areas a big number of imported and non-seasonal commodities are offered. There are several markets and huge numbers of small grocery stores spread all over town. While at the market all kind of food and non-food products are available the shops usually sell processed and packed food products next to non-food products to satisfy the daily demand of the customers. These shops hardly offer any local and unprocessed products. They sell mainly products which have a long shelf life, are easy to prepare, convenient products, or are secondary ingredients for meal preparation. As most of the shops are connected to the electrical network this allows them to have a refrigerator or freezer to store fresh produces and to sell certain prod-

[131] For example, community work (*nafir*) is a very important institution of the rural economy and social network. For some agricultural activities the households depend on the help of neighbours, friends, and relatives. For one day a whole group will work on one field to get certain activities done. This kind of help is mutual and the workers are provided with food and drinks during that day by the owner of the field (Rheingans 1994, Rottenburg 1991). With the decrease of rural population the nafir becomes ineffective because with less people one day might not enough any more and so the cost (serving of food and drinks) for the field owner becomes very high. Hence, the community work is decreasing. But community work has not only an economic effect but is also of social importance. The mutual help creates identity and strengthens social networks which guarantee security during crises. A decrease of the community work in that case means a weakening of the social network (Rheingans 1994).

[132] Urban agriculture is a common and important instrument in many towns, growing some food on household level. But this does not happen so much in El Obeid. Because of limited space and the dry environment hardly any urban agriculture is practiced. Some families might have a very little kitchen garden which does not contribute a significant amount to the household food supply. Some families might have some chicken but they have an income generating function since the eggs are sold.

ucts chilled. The supply of traditional products, which are already processed is not common or limited to small private enterprises as the processing usually is very time-intensive and is not done on a commercial level.

The supply of certain food products differs between the quarters. It is significant that the variety and quality of commodities is the biggest in the town centre around the central market. Apart from the big amounts of national food products (unprocessed and processed) many shops provide imported, convenience, and luxury food products. For example, in shops around the central market it is much easier to find imported dairy products (packed milk, yoghurt, cheese), wheat and maize flour, oil (sunflower oil), sweets (biscuits, chocolate), breakfast cereals, and fizzy drinks. The density of shops and markets, the amount of products, and the variety and quality of commodities decreases when leaving the town centre. In the second circle markets and shops still provide many basic food products (flour, pasta, rice, tea, sugar, oil) but hardly any luxury food commodities or imported goods. The smaller variety becomes obvious when for example comparing the offer of bread. On the central market different kinds of wheat bread can be found. It is all white bread but it might have different shapes (round, sticks), consistencies, and actually vary in taste. The consumer has a choice. Outside the town centre there might be only one bakery in quarter which produces all the bread and supplies all the shops and traders in the area with the same kind of bread. This also applies to fizzy drinks. A shop in the town centre offers several kinds of packed juices and a wide variety of soft drinks bottled or even canned from all different kind of brands. By contrast shops outside the town centre mainly offer a few different bottled soft drinks but no juices or cans.

In the outskirts the number of markets and shops decreases strongly. The markets are mostly closer to the areas of the second circle and the food and commodity supply is very moderate. The amounts and variety of food is limited. Mostly seasonal local products are offered. Many stalls are only open in the morning or until the products are sold out. The number of shops in the outskirts is also quite small. In contrast to the first or second circle, where small grocery shops are found at almost every corner, in the outskirt there are just a few of them with distance of about 0.5 to 2 km. Most of these shops are not open on a regularly basis and the amount and variety of the food products is very small. Often they just offer some basic foodstuff like pasta, rice, sugar, tomato paste, oil, salt, and pepper. As most of these shops are not connected to the electricity they do not sell any chilled or fresh products. Most shops in the first and many in the second circle have full and packed shelves with many different products, whereas the shops in the outskirt have scarcely filled shelves with only few products.

The quality of the food also decreases when leaving the town centre. Those living further away from the centre have a limited choice regarding the quality and quantity of the products. The fresh products sold on the market and the products sold in the shops are often of inferior quality, not very fresh and stored often for a long time already.

The market supply of the different circles commensurate to a large extent with the purchasing power of the people living in the different areas. As the prices do no vary from shop to shop or area to area this has got no direct effect on the households related to the area of living. But trader only offer products which the people in the areas are able to buy. However, especially

in the outskirts the limited supply also restricts those affected. Depending on the mobility of the people, which is closely connected to income and time, they might only be able to buy what the nearest market or shop offers. If the supply is limited, they have to buy what they get for the offered price. Low-income household in the second or first circle have a much bigger choice depending on the supply, season, opportunities for variation, and good offers.

The case of Amna and Lubna illustrated that even the small distance to the central market, which has sufficient and diverse supply, or the high mobility of the family members does not provide much consumption choice because of the income situation. Nevertheless, their possibilities for getting at least some variations of food products are higher than for Zuheir's and Amel's families. Households with a higher income show more mobility. They can cover the cost of transport to purchase food commodities in specific places where they find the desired products. The higher income and mobility give these families much more flexibility to fulfil their individual preferences. Furthermore, better-off families usually live in the town centre or close to the town centre. In that case the market supply already has a bigger diversity and often better offers.

There has been no specific research but it could be observed that big traders who are found in the town centre or near the town centre have a much higher margin. They purchase bigger amounts of food and are more flexible to make sales or special offers. Traders in small quarter markets and shops have smaller margins as they only purchase little amounts, which allows them not much room for bargaining.

The income, other household expenditure, and the preferences of the households determine their consumption behaviour. With increasing income households buy not only bigger amounts of food but also a bigger variety. They are not limited to basic products, seasonal or low price food. Apart from a higher consumption of energy-, protein-rich products, and sugar, they also consume more convenience, imported, and luxury food products. Generally, the share of cereals decreases and the share of meat increases with a raising income. In low-income households the earned money is in most cases the limiting factor for the household's food supply. As they cannot invest bigger amounts of money they have to buy small amounts of food often on a daily basis. Hence, they often have to pay a higher unit price. In contrast, households with a higher income often do the main shopping on a weekly basis or twice a week. They are able to invest more money in bigger amounts of food which often have a smaller unit price. Even if the unit price would be the same, high-income households have a higher bargaining power to get a better price.

13.2.2 Household Food Supply

It is tradition in Sudan that the shopping is done by men. Islamic and Sudanese norms say that the men is the provider of food and shelter and the women the housekeeper and food distributor within the family. Therefore, the money spent on food also has to be provided by the male. The children and women only do the small and daily shopping in shops and markets close to the house, usually buying things which are needed urgently or required to finish the meal preparation. It depends on the cultural and socio-economic background, age, locality, and

attitude whether a woman does shopping at the market or not, whether she only goes in a group of women, accompanied by a male, or on her own. However, middle and upper class women see it as a privilege to stay at home and not to have to do the shopping.

As the cases of Hiba, Mona, and Amna showed, the major shopping is done by the male head of the household. This is largely determined by norms and customs. It is closely linked to the fact that the women are responsibility for preparing the meals and taking care of the housework and children. So the women actually do not have much time left to do the shopping. Nevertheless, the case of Hiba showed a woman leaving the sphere of home to become a working woman does also not mind to do the shopping on her own[133]. She even prefers to join her husband for the shopping to get better quality[134]. In Amna's case the family sticks very much to traditions and norms, hence she does not do the shopping. They have a strict division of male and female spaces which includes the shopping.

Lubna's, Amel's, and Zuheir's situation is different. Even if the husband provides the main share of the money spent on food, the shopping is done by the women or daughters and they pay part of the food. As a modern working woman would consider this behaviour as achievement of the modern life, for Lubna, Amel, and Zuheir this is essential for the livelihood of the family and seen a sign of low income and low status.

In case the men do the main shopping, it is done once a week. It is very common that they do it on Fridays as they are working during the week. Amel's, Lubna's, and Zuheir's families do the shopping on a daily basis or several times a week because of lacking money and limited storage facilities. In these cases shopping is also done by the female household members as the men usually work during the week or even on Fridays.

As already mentioned, traditionally the money spent on food and daily living expenses has to be provided by the men – even though in most cases the women decide how the money is spent. This applies to most families no matter which strata. In low income situations female household members sometimes contribute to secure the livelihood of the family as in Zuheir's and Amel's cases. Also in the case of Hiba and Mona female household members do some food shopping and spend their own money. But the situation in Mona's family is special as her husband passed away and her adult children take financial care of the whole family. Nevertheless, especially in households where the male income can cover the living expenses, tra-

[133] But her possibilities are also limited as she has not the physical strength to carry heavy shopping bags home and as she cannot drive the car. In that point she is dependent on her husband. Of course she could use a taxi to get the shopping home. But this would give a very bad reputation on her husband not taking care of his wife and family.

[134] As long as women do not do the shopping they seem not to complain about the quality of the food their husbands or sons buy. But as soon as they do some shopping themselves, especially vegetables and fruit at a bigger market, they realise the possible qualities.

Once I bought some vegetables and fruit at the central market for a family in El Obeid I am friendly with. The mother and the daughters where astonished about the good quality of the food. So, they asked me where I bought it and where surprised that I bought such nice food in the same place and at the same price where the family's father does. They never before had an idea that it was possible to buy high quality for the regular price because the family's father was doing the shopping and never looked for the quality of the food.

ditionally the spending of 'female' money on food is a clear crossing of the borders of the gender spheres[135]. However, more and more young women with their own income and daily activities outside the home take over a part as provider. Even though their money is not needed for the household's food supply, they consider their own food shopping as part of their modern way of life and their personal freedom.

The purchased products are mainly unprocessed food like vegetables, fruit, cereals, and meat or pre-processed food which still needs preparation or are ingredients like oil, groundnut butter, tomato paste, and sugar. Bread and maybe ful are the only food products which do not need any further preparation and are fit for eating. It is characteristic for the Sudanese food system that food products are fresh and have to be prepared at home. This applies to all strata and age groups. Industrial food or convenient food which is ready to eat or just needs heating up is hardly found. There are a very few selected shops in El Obeid which sell instant soup powder but it is very unusual that someone consumes these kind of products. The usage of instant or convenience products might increase in the future as these products are easy to prepare and very comfortable for working people. This trend can be already observed in Khartoum/ Omdurman where convenience food is already found in many shops. But as these products are imported and expensive the access is limited to higher income groups.

The household food supply through urban agricultural or horticultural production is of no importance in El Obeid because of limited space, time, and the environmental conditions. To some extent households may grow some food plants in their yard or keep some chickens or goats which provide a meal once in a while. It is much more common that urban families might receive agricultural products from relatives living in rural area but this occurs just occasionally in most cases.

13.2.3 Food Storage and Preservation Methods

The methods of food storage within the household are determined by the available facilities in the household. In low income households and especially households living in the outskirts refrigerators are not common. Due to lack of money these households cannot afford the equipment as well as the electricity to run a refrigerator. In middle and upper class households refrigerators including a little freezer or even a separate freezer belong to the basic equipment. This gives them the opportunity to store fresh food for a certain time so they can buy bigger amounts of fresh food and need less shopping trips. Furthermore, a refrigerator and freezer allow storing prepared dishes for several days. Hence, bigger amounts of food can be cooked at once and stored which also reduces the effort of food preparation. For example, Hiba's and Mona's families do the main shopping about once a week and store all the fresh food in the refrigerator. Moreover, both women do not cook every meal every day but prepare bigger

[135] On one hand this could mean less power for the man and more power for the woman. On the other hand it might be an advantage for the man that he might get better food when the wife does the shopping to get better qualities.

amounts that will last several days[136]. Additionally, the available storage place determines the shopping behaviour. Amna's, Lubna's, Amel's, and Zuheir's families have not much space for storing food, so they have to do the shopping more frequently.

Sun-drying food is an important preservation method in the Sudanese food culture. Dried okra (weika), onions, and meat (shermout) are typical ingredients for many different traditional dishes. Today products like weika and dried onions can also be bought. Of course they are more expensive than processing them at home, but like Hiba some women actually prefer to uses fresh products because it is quicker and needs less storage and processing capacity. Even though the food habits and preparation methods are quite traditional in El Obeid, a change in the preservation methods is obvious. It is very common to substitute shermout by fresh minced meat and dried onions by fresh onions. This changes the taste and viscosity of the dish to some extent. Exchanging weika by fresh okra would create a completely different dish. Hence, weika is not replaced by its fresh substitute. As there are comfortable alternatives to sun-dried food this processing method is not so much determined by the recipes of the dishes. It is much more a matter of attitude, time, space, and income if women dry food or not. Households with more traditional food preparation methods stick to sun-drying of food while the 'modern' Sudanese women cooking in a 'modern' way choose timesaving and more convenient alternatives of fresh products.

The storage of food is the domain of the women. Even though men supply the food in many cases, as soon as they give the food to the women they hand over the control too. Hence, all ingredients stored are the sovereignty and the property of the woman. She controls them and decides about the use.

13.2.4 Meal Preparation

Food has to be prepared to become a meal. As in most households in El Obeid mainly unprocessed food is used, food preparation is a very important process for the diet of the family. Even simple dishes like a thin mulah or just a salad have to be prepared which takes some time and effort. The process of meal preparation is the link between food supply and meal consumption. It is the transformation of the raw product into an eatable meal.

The procedure of daily food preparation is a routine and done without a lot of thinking about norms and rules. Even though the one who prepares the daily food does not always think about it, cooking is a highly cultural procedure impacted by many socio-economic and socio-cultural influences. The step which transforms a food product into a meal is a highly cultural element. Many middle and upper class households employ housekeepers for doing the laundry, cleaning, and other services in the household. However, it is very uncommon to hire someone for the daily food preparation. It is the exclusive responsibility of the mother, often assisted by teenage or adult daughters, to guarantee a sufficient meal for the family. That re-

[136] For example, a bigger amount of tabikh is cooked about twice a week and stored in the refrigerator available for the daily consumption.

flects the importance of food preparation in the Sudanese food culture within all strata. The kitchen represents a place of culinary knowledge and moreover an institution of cultural heritage. Awareness of social and cultural norms reflects in the way of cooking through the consideration of certain preparation methods, table manners, and eating taboos. This knowledge is passed on from one female generation to the next which makes the kitchen into a source of socio-cultural and technological knowledge and skills.

The cooking skills of a woman also are very important for her reputation within her social environment. The ability of a woman to be a good mother and wife is very often measured in the quality of their food preparation. If a woman is able to prepare the common dishes that are tasty, she has a good image. If she is not, there definitely will be gossip about her skills, not only as cook but also as wife and mother. Being not able to prepare a good meal is not only shameful for the woman but also for her husband. As the provider of the unprocessed food his wife shows her respect towards him by preparing nice, tasty, and sufficient meals from it. If she does not, it would look as though he married a woman who cannot cook, is not able to take care of the household and children, and that he is not respected by his wife. Even in poorer households the women have to be able to present guests with extensive meals and plenty of food (within their means) which tastes good.

The cases showed that homemade food is of high importance for the human nutrition in El Obeid. Even though there is a trend of consuming more and more street food and processed staples like bread and ful most of the dishes are prepared at home. As the urban cuisine and its preparation methods are much more extravagant than the rural ones, the purchase of pre-processed and processed products would just mean a little relief for the ones preparing the meals. Women spend many hours everyday to make meals possible. All introduced cases showed that meal preparation played in a central role in the diet and the livelihood securing activities of the families.

For food preparation three different kinds of cooking facilities are used. The first method is to cook with firewood, where the fire is lit on the plain ground without a stove. Apart from all kind of dishes traditionally kisra is prepared on a wood fire. For that the metal kisra plate is set on the fire with stones under every corner. This way the fire is easy to control by adding or removing wood from beneath the plate. Today in towns hardly any other dish is prepared on a wood fire. The second method is to cook on the kanon. It is a traditional charcoal stove which is used to boil, roast, and fry all kinds of dishes. The pots or pans are set directly into the charcoal. Sometimes a grill is put on the fire to roast meat. Usually every household has a kanon and in El Obeid many households use the kanon for daily cooking. Using an open fire (charcoal or wood) requires an open yard, shelter, or well-ventilated hut with unsealed or non-inflammable floor where the fire can be lit without any danger.

A more modern way of cooking is using a gas stove. These gas stoves are connected to a gas bottle which can be bought or refilled in many shops. Cooking with gas is very typical in urban areas. Many people think it is the best method and a modern achievement, as it is clean

without any smoke and easy to regulate and use even in closed and poorly ventilated room. There is no need to set a fire and the food cooks much faster than on a kanon[137]. Some modern households also have an electrical kisra plate or one which can be connected to the gas bottle. Concerning the cost gas and charcoal are about the same price (cost per cooking period). Nevertheless, the initial investment in a gas stove and bigger investment in buying or refilling the bottle (SP7,000 to SP25,000) are higher than investment in charcoal which can be bought at a lower price (500g for SP500). Therefore, low-income households mainly cook on a kanon.

Traditionally, the cooking is done on a wood fire or the kanon. For example, the traditional aceda pot has a hollow shape to sit well on the embers or the charcoal but not on a gas stove. Especially elderly and rural women make jokes about modern urban women using gas or even electricity for cooking aceda. They say urban women do not know how to make aceda because they do it on the gas stove. According to them it also influences the taste. It actually could be compared to having a barbecue on a proper charcoal grill, getting the typical barbecue taste and a barbecue on an electric grill. It is not only the taste that makes the food preparation on a kanon or a wood fire special. The kanon or wood fire can be placed anywhere in the yard or in a house with unsealed or non-inflammable floor. The one who prepares the food is not bound to a certain place. Moreover, cooking with a kanon can be done sitting down. This is much more comfortable during the time-intensive and strenuous process of cooking.

Even though all middle and upper class households own a gas stove and only a certain number of low-income households in urban centres possess a gas stove, using wood and charcoal or gas does not exclusively depend on the strata. Many urban women of all strata, especially of older generations, still cook in the traditional way. As long as the families live in houses with open kitchens or an open yard and have enough time to light the fire most cooking is done with the kanon and kisra is mainly baked on a wood fire. But the trend for young middle and upper class women is to use gas because it is cleaner, more comfortable, faster, and modern. Older generations rather stick to the traditional cooking with charcoal and wood. Many young women think that using a kanon or the saj is binding them to the kitchen as traditional cooking requirements a lot of work and time. That is a picture many young, modern, especially working women cannot identify with.

Despite of the cases showing obvious variations in the food habits there are many similarities regarding the basic kitchen equipment and the way of food preparation. All households own several pots, pans, dishes, and tools which are necessary to prepare different common dishes. Some households own smaller numbers of kitchen equipment than others and the tools (mincer, mortar, stirrer, blender, pans, pots) might be simpler and moderate but they are used in the same way. Amna, Amel, Lubna, and Zuheir make similar basic dishes in a similar way. They all prepare kisra (aceda) and mulah for the main meal using a wood fire or a kanon.

[137] Especially in Khartoum it can be observed that more and more people live in apartments. Without an open yard the use of gas and electric stoves is unavoidable. The trend cannot be observed in El Obeid yet. Families still live in houses with yards and enough space and the lifestyle is much more traditional than in Khartoum.

Mona who prepares mainly urban dishes also uses the kanon. Although Mona's family can be classified into a higher income group with different eating patterns than the others, her way of preparation does not differ a lot from lower income groups. While Amna's, Amel's, Lubna's, and Zuheir way of cooking is influenced by their present economic situation, Mona's is determined by traditions, her experiences, and preferences. It is very likely that the other four would also stick to that way of food preparation in case of higher income. The exceptions are Hiba and Mona's daughters (all as a younger generation) who exclusively use the gas stove as part of their modern lifestyle.

It could be expected that the time spent on cooking decreases in towns as many women are working. But it is the other way around. To fulfil urban standards the required cooking time increases drastically. For a rural meal aceda/ kisra and mulah and some salad might be enough. A proper urban meal, however, has to contain several complicated dishes like tabikh, meat, pasta, and something like geema or mashi. This does not only increase the cooking time but also the cost as these dishes contain a lot of oil, meat, and vegetables and have to be cooked longer. Nevertheless, because of the market supply of certain semi-processed products (pasta, flour, meat) urban women can skip some time-intensive and strenuous tasks like hand milling. On one hand it is important for many families to fulfil the urban standards and they think it is an achievement to eat urban dishes on a daily basis. On the other hand many women complain about the long time, effort, and cost of the preparation.

As the preparation of urban dishes is so time- and cost-intensive many women do not prepare every dish everyday. Especially in middle and upper class households, where mainly typical urban dishes are consumed, women tend to cook many dishes just once, twice or three times a week in larger amounts and then store it in the refrigerator. Therefore, the dishes have not to be prepared every day but still can be consumed daily. Nonetheless, cooking takes many hours every day.

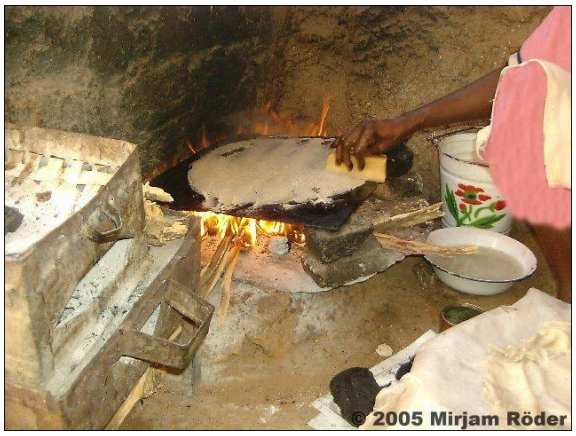

Figure 21: Kisra making

Figure 22: Cooking in Sudan using a kanon

Figure 23: Cooking aceda on a gas stove

Figure 24: Cooking in an aceda-restaurant

For Amna, Amel, Lubna, and Mona cooking is a ritual. Their food preparation is essential for the family's diet. Even if it is very time-intensive and exhausting they like to do it. It is their duty and their passion. For them cooking is one of the most important tasks of the day. For Zuheir and her daughters food preparation is much more a means to an end. Their possibilities to cook a sufficient meal are very limited. They do not mind to cook but they also do not like it because of the limited possibilities. Hiba on the other hand does not like cooking at all. She just does it because she has to do it – for her it is a duty. She actually only takes the responsibility of cooking because she wants to guarantee her family a healthy and sufficient diet. Furthermore, she only cooks certain dishes (e.g. tabikh) because of the norms. If she did not have the social pressure, she would make different food. She already follows a quite modern way by using a gas stove and spending not more time than necessary for cooking. For her cooking is a time-consuming and social burden and not the most important task of the day.

13.2.5 Meal Serving and Meal Consumption

In most households in El Obeid the way of serving and eating meals is traditional. Meals are served on a round tray (siniya). Bowls and plates containing the different dishes are placed on it. The participants of the meal sit around the siniya and eat with the right hand. They separate a piece of the dish with the fingers, form it into a lump, and eat it. As all eat from the same bowl the food is picked from the side of the bowl nearest to oneself. In rural areas and in many urban families at least four fingers are used and the lump is formed in the whole hand.

Some people of the urban middle and upper class only use the fingertips of the thumb, index, and middle finger to cut and form the food. They think it is disgusting and rural to use the whole hand[138].

> "The market folk [traders and urban citizens in the late 19th early 20th century] also eat with their hands but they lay great stress on washing them before and after the meal and on touching the food with the tips of their fingers only and not with the whole hand. Most importantly they are careful that any food that has touched the hand does not fall back into the common bowl." (Beck 1998: 270)

Eating with the hand is a very enjoyable event for Sudanese. Many say eating that way is very relaxing, while they think it is uncomfortable to use cutlery. Most households own some cutlery but in many cases just some spoons. Better-off households, like Mona's and Hiba's family own forks and knives but only use them for very special occasions. Usually they are just kept in the cabinet as part of the trousseau. There is no tendency that people shift from eating with fingers from the same siniya to using separated plates and cutlery[139].

The event of sharing the meal moves people closer together and creates an atmosphere of courtesy, consideration, and respect. It forms a strong bond between all participants. Whether a meal is eaten together within the family or separated by gender depends on the situation. When there are no visitors or a visitor who is very close to the family the meal is usually eaten together. However, it is common to eat separate by gender if there are guest. In that case two siniyas are set and served at the same time. It is not common anymore that the men are served before the women with only one siniya being set and refilled for the women after the men have finished, as seen in Amna's case.

The number of daily meals is determined by the financial situation of the family as well as the extent of the different meals. Middle and upper class families, like Hiba's and Mona's family might have three meals a day, while low-income households, as the other four cases showed, might have two or even just one meal a day. The meals have to be differentiated between everyday meals and meals for special occasions and holidays. The meals during the week usually are more simple and do not contain as many dishes as the meals on holidays. Furthermore, meals for special occasions often present traditional dishes like aceda and have to contain at least one dish of meat. The return to traditional dishes applies mainly to middle and upper class families, while low-income households rely to a big extent on reasonable rural/ traditional dishes in their daily diet as the cases of Amna, Lubna, Amel and Zuheir illustrated.

Most families drink tea and maybe eat biscuits in the early morning after their morning prayer. The tea is black tea with sugar and (depending on personal preferences and availability) spiced with mint, cardamom, cinnamon, or ginger. Sometimes it contains (fresh or pow-

[138] For me it seemed impossible to eat aceda or kisra with mulah by hand just using three finger tips. It also can be observed that people who only use their finger tips mainly eat bread and not kisra or aceda.

[139] The use of cutlery is disputed in the Islam as eating with fork and knife would mean using the left hand which is evil.

dered) milk. Sweet tea[140] early in the morning gives good energy because of the sugar and the stimulating effect of the tea. Apart from the tea in the morning, tea also closes every meal and is an important sign of hospitality and community.

Breakfast (*al-fatur*) is usually eaten at about 10 o'clock. Depending on the daily activities of the household members it is eaten at home or out. Usually household members who do not work have a little breakfast at home (non-working mothers, small children, elderly people). Their breakfast is usually quite simple containing ful, salad, eggs, cheese, or jam eaten with bread. Some people go home for breakfast when the school or working place is close to the house. Otherwise they have breakfast out - either buying sandwiches or ful or taking home-made sandwiches with them.

Ful is the most popular breakfast in urban areas. Many shops sell it and many restaurants and bistros serve ful for breakfast. Eating ful in public is actually a very social activity. It is very common to share a big bowl of ful with colleges and friends, which is somehow the substitute for the common family meal. The majority of the street restaurants are only visited by men, but there are places where women meet for breakfast. However, these are usually cafeterias within their working place. When eating in public places there is a strict gender division. Once women are married they do not join male friends or colleges for eating in public on their own anymore. Nowadays in universities and within younger generations genders might mix for eating even in public.

On holidays or special occasions breakfast usually differs from the normal breakfast. The breakfast is eaten later as more different dishes have to be prepared. The food does not vary from special occasion to special occasion. It is mainly the same food following typical Sudanese traditions and norms. In North Kordofan and western Sudan it is common to eat aceda with mulah (rob and maybe shermout). It is the main dish and has to be accompanied by a sweet dish such as sheiriya or salabiy. Furthermore, ful, salad, tamia, eggs, sheia, or cheese are served. The norm says that for an urban holiday breakfast at least five dishes have to be served. Aceda and the sweet dish are a must and at least three other have to be served as well. One should be ful and one should be some kind of meat. Bread also has to be served for every breakfast if anything else than aceda with mulah and a sweet dish are eaten. One can say that the breakfast during the week is typically urban food while on special occasions and Friday's traditional (rural) food and urban dishes have to be served. While in all cases Fridays and holiday are celebrated at least to some extent with special meals, Zuheir's family does no make any exceptions on Fridays due to the economic situation of the family.

[140] Tea is not a traditional drink in Kordofan. It became popular in the early 20th century under the British rule. Coffee has been known a little longer since it was introduced by the Turkish in the 19th century (Hesse 2002). Before that mainly traditional drinks made from sorghum, millet (beer), or fruit were drunk. Whenever tea or coffee are drunken huge amounts of sugar are added. Tea without sugar is not tea. Beck (1988) and Hesse (2002) call the strongly sweetened tea a kind of drug which stimulates the people. Of course it has the effect of feeling awake and energised and somehow people are addicted to it but experiencing the hot dry weather in Sudan shows that the body needs a lot of high energy which is quickly available for the metabolism.

Lunchtime (*al-ghada*) depends on the activities of the household members. In many families it is eaten at 3 or 4 p.m. or even later, when everybody is home from school, university, or work. No matter what is eaten, lunch is the most important meal of the day. For many households it is the only meal eaten together. People do not just see it as a meal. It is also an opportunity for communication and socialising. In Zuheir's and Amel's cases it could be observed that lunch might not be eaten together with the home family. These two families adjust the eating time to the presence of small children and not to returning family members from work as practised in the other cases. However, in Mona's case the daily lunch has also almost disappeared due to the lifestyle and daily activities of her children.

Friday lunch as Friday breakfast is an even more important social event. In some families, as in Mona's, it is the only meal of the week they all have together. Moreover, Friday is the day to visit or invite friends to sit together and eat with them.

Dishes for lunch in urban areas vary from household to household mainly depending on the economic situation, individual preferences, and the time factor. Some households might just eat kisra with mulah or even salad only (Amna, Amel, Zuheir, Lubna) while the typical middle and upper class households eat several dishes of which one has to be tabikh (Hiba, Mona).

Whether a family eats kisra, bread, or both depends on different factors. Homemade kisra is cheaper than bread or bought kisra. For some people, as Amel's and Zuheir's families, this is the main reason to eat kisra. Even though Amel family eats kisra because of economic reasons, they also belong to the ones who just prefer kisra to bread because of the taste. Nonetheless, many urban citizens prefer bread not because of the taste like Mona's children, but because they just can buy it everywhere, it is cheap, and it can be eaten with all kinds of dishes, while kisra can only be eaten with mulah, tabikh, and salad. Although tabikh is mainly consumed with bread. Some families have kisra with mulah for lunch and in addition serve tabikh with bread. Many middle and upper class families do not eat kisra at all during the week, and many people in the younger generations do not even like kisra.

The typical urban middle and upper class lunch contains tabikh usually eaten with bread, salad, and some dishes like geema, kufta, mashi, salata aswad, fried or roasted meat, chicken, kebab, pasta with cheese, potato chips, or pizza. With or after lunch usually a dessert is served. This might be rice with sugar or custard, a sweet custard pudding, jelly, biscuits, fruit salad, or some other sweets.

On special occasions lunch in most families consists of even more dishes and traditional food. A household might serve kisra with mulah in addition to tabikh. Like aceda for breakfast, kisra is important for lunch on holidays. Furthermore, a holiday lunch usually consists of up to ten dishes of which at least one is meat or chicken. This mainly applies for upper and middle class families as Mona's and Hiba's family. In lower income groups special occasions are very rare as the other four cases showed. Lubna's, and Amna's family try to have at least on Friday some specials for lunch and when there is a special occasion, they usually eat tabikh and one or two of the other urban dishes. It is basically the same behaviour as in richer families just on a more moderate level. The number of dishes increases and meat is part on the menu at least in form of tabikh. Apart from Zuheir's family which might only increase the

meat content of the mulah and add some potatoes or vegetables for the meal, Amel's family makes an exception as they stick to kisra and mulah even for special occasions. Still, they usually have another mulah and also add some urban dishes.

The late supper (a*l-asha*) at about 9 or 10 p.m. is a typical urban middle and upper class meal. In rural areas people traditionally just have two meals a day (breakfast before going to the field and a late lunch after coming back). As urban lunch is usually quite heavy, supper is (when eaten) just a light meal. Hiba's cased showed that for some people drinking a cup of tea with milk or a cup of milk is already supper. However, many families also eat something light like ful, sandwiches, chicken, meat, a thin porridge from millet (medida), rice pudding, or sheiriya. Sometimes leftovers are eaten but always with bread, never with kisra. Only on special occasions, especially during fasting, the supper is bigger and contains many different dishes.

Most dishes of an urban meal are not traditionally Sudanese. Originally they where introduced to Sudan by the Turks and Egyptians. By now many urban people call it traditional Sudanese food, meaning traditional urban dishes. Historically, it is the cuisine of the Nile Valley influenced by the Turkish and Egyptians. Bread made from wheat and meat are central elements. While the nomads of Kordofan mainly ate meals made of millet and milk or spiced water (Beck 1998), traders who came from the Nile Valley to Kordofan preferred a daily cuisine with meat and variations. Compared to the traditional rural dishes (aceda/ kisra with mulah) the preparation of urban dishes is expensive as a lot of oil, vegetables, and meat are needed. Apart from salad all these dishes are very high in nutrition which does not stand in any relation to the daily activities of urban people. With increasing income the consumption of meat and sugar increases and that of cereal products decreases. Hence, there is a strong trend of over-eating and over-consuming energy- and protein-rich food especially in urban higher income groups. The traditional rural diet is much lower in nutrition and energy even though the physical activities of the rural population are probably higher. The calorie intake in rural areas is mainly covered by cereals (carbohydrates).

Figure 25: Urban breakfast with aceda and mulah rob, sheiriya, tamia, ful with salad, bread, and spices

Figure 26: Urban dinner with kisra, mulah bamia, tabikh garah, salad, bread, rice, and spices

13.2.6 Special Occasions, Religious Influences, and Magical Meanings

Importance of Food for Special Occasions and Its Meaning

Food for special occasions plays a central role in many cultures and interacts with rules, norms, rites, and spiritual behaviour. A special event without a certain behaviour concerning the eating (no matter if fasting or feast) is unthinkable. Apart from Fridays Sudanese have several special occasions which are mainly religious events or traditions like name giving, circumcision of boys, weddings, return of a travelling community member, or welcoming guests. While the reasons of the celebrations are various, the food is always quite similar. The serving of traditional dishes for celebrations is very important. Some of these dishes are a return to a simple diet which everybody can identify with since the ancestors used to eat this food. However, in urban areas the meals for special occasions also contain typical urban dishes, which are served for daily meals, but the number of dishes is higher and the amounts are much bigger. In any case traditional dishes like kisra and mulah um-rigeiga and plenty of meat have also to be served.

Especially for religious events the return to traditional meals and products is most important. This is not only because of the connection between religion, rites, and traditions. Huge amounts of food are prepared not only for guests but also to give to the poor. So the food has to be simple and not exclusive, otherwise it would underline the economic differences which are not supposed to be relevant because by the grace of Allah all people are the same. Hence, it is quite common for many feasts to serve aceda with mulah shermout or kisra with mulah um-rigeiga, local fruit, and traditional drinks. Nevertheless, meat is also very important and traditionally a sheep will be slaughtered as a sacrifice to Allah, to honour the guests, and to underline the importance of the event.

Ramadan is in the ninth month of the Islamic year and the fasting during that month is one of the five pillars of the Koran. This is the month in which Mohamed received the first Koran revelation. Following the Koran Ramadan is the time when the believers strengthen and concentrate on their piety. The reading of long verses from the Koran in the mosques and long praying as well as the fasting are characteristic for Ramadan. The fasting starts at the sunrise and ends with sunset every day. Throughout the fasting Muslims are not allowed to eat or drink anything. Before the sunrise Muslims have a light meal of tea and some sweets. As soon as the sun sets and the prayer is finished the people break the fast. That is when the main meals of the day are eaten. When the fast is broken the body has not had anything to eat or drink for sometimes more than twelve hours. Therefore, it is very important to start with a light thirst and hunger quencher to stimulate the metabolism and to supply the body with quick energy. People usually drink traditional beverages from local fruits (tamarind, tabaldi, roselle, fruit juice) or have traditional drinks or thin porridges made from sorghum. The thin porridges (*medida* and *nasha*) are also given to ill people and breastfeeding women as they are easy to digest and rich in nutrition and energy (cf. Dirar 1993: 140-152). Traditional sorghum drinks are *abreh* and hulu-mur. For both a dough of fermented sorghum containing numerous spices is baked into thin sheets on the saj and then dried. The dried flakes are then soaked in water and filtered to make the drinks (cf. Dirar 1993: 187-210).

After the drinks dates and other dried fruit are eaten to support the digestive activities. A dish called *balilla* is a typical starter at fast breaking. It is made from soaked dates, raisins, or soaked and cooked pulses (chickpeas, cowpeas). Dates are very important fruit in Islam as they are mentioned in the Koran many times. According to the Koran dates often were the fruit which saved people from starving, when nothing else was available to eat. Furthermore, Mohamed used to eat dates for fast breaking. It is also said that the first mosque Mohamed built was mainly build with material from the date palm.

A Ramadan dish, which is typical for Kordofan, is *malill*. It consists of fresh sorghum, harvested before it is ripe. The green, yellowish grains are baked and then cooked in water. In El Obeid the baked sorghum can be bought on the market. It is hard to find it anywhere outside Kordofan.

The Ramadan break fast meal contains aceda and a mulah with meat (shermout, tagaliya, nieimiya), ful, tamia, roasted meat, and sweets. In Kordofan the aceda eaten during Ramadan is usually made from millet – the traditional staple, even if it is more expensive than sorghum. The women usually eat this meal at home or at a friend's house while the men usually eat it in public sitting together with friends. Late at night another meal (supper) is eaten usually containing fish, meat, or ful. This meal is more of a snack than a proper meal.

Ramadan ends with the feast of Id al-fitr. The feast starts with a special prayer in the morning and is then celebrated for three days. As part of the feast people pay the zakat and give alms and food to poor people. For these three days a lot of food (aceda, mulah, ful, meat) is prepared, people visit each other, and eat together. Some families slaughter an animal. It is also common to exchange presents with family members and friends.

The last month of the Islamic year is the month of the haj. On the tenth day of this month, 70 days after the end of Ramadan, the most important Islamic feast Id al-adha is celebrated[141]. All families who can afford it have to slaughter an animal (usually sheep) to sacrifice it to Allah (*karama*). A big part of the slaughtered animal is distributed among the poor.

The consumption of meat testifies a high status while the slaughtering of an animal is of even higher prestige. Even though the urban population now has an increased meat consumption traditionally meat was just eaten on special occasions. In rural areas cereals are the main staple. Even if the household owns a big number of animals aceda fills the stomach and meat is just put on the top. Not only for id al-adha but also for special occasions like circumcisions, weddings, name giving, or when having visitors the slaughtering of an animal in the guest's honour raises the reputation of the host immensely.

The slaughtering of an animal always has to have a ritual connection. Slaughtering just from the desire to eat meat is unacceptable. Hence, if people want to eat meat they always find a good reason for it. The sacrificing of an animal is not a private event but closely connected to social behaviour. It is always tied to sharing with others and honouring Allah. Not only the

[141] This is based on the story when Ibrahim was asked to sacrifice his son to God. As he passed this obedience examination he was asked by God to scarify a ram instead.

sacrifice itself but also the process of slaughtering is a ritual action. Women and non- circumcised boys are not allowed to slaughter an animal, not even a chicken. As the procedure of slaughtering is a rite every action which does not follow the rule makes the meat impure. The slaughtering, skinning, gutting, and cutting of the animal are exclusively done by men. It is carried out in the early morning after the prayer. The animal's head is turned into the direction of Mecca and while speaking the name of Allah the slaughterer opens the aorta to bleed (Heine 1994). The men also prepare the gut parts (*marara*) like the lung, liver, and stomach by spicing it with salt, pepper, and chilli powder. These are eaten raw. The men also roast some of the meat on embers, but the major part of the meat preparation is done by the women. This often takes until the afternoon. The women usually roast the meat in a pan and cook the guts into a soup (Beck 1988).

Food and Magical Meanings

Apart from the dishes for special occasions there are a number of dishes which are supposed to have magical effects. These are mainly products which are rich in vitamins, mineral nutrients, and protein. Some of these products are even said to protect the consumer from the evil eye which can cause illness and crises. One of these products is milk. Many rites are connected to milk in the Sudanese culture (Dirar 1993). This does not only apply for the consumption of milk but also for external use. After eating aceda or kisra with a mulah made of milk like mulah rob, some do not wash their hands but rub them on the face. They believe that milk and sorghum protect from bad eyesight and blindness. Furthermore, new clothes might be speckled with milk before wearing (Dirar 1993). The most popular rite of using milk in the Sudanese culture is during weddings. On of the highlights during the celebration is when the bride and groom are speckled with milk and then share a goblet of it. This is believed to bring them luck and fertility (Dirar 1993).

In addition, aceda is believed to have a magical effect. It is especially given to brides, pregnant women, and ill people to strengthen them. There is a rite of aceda eating (*akl-al-aceda)* which is held when a woman announces that she is pregnant. All the women in the neighbourhood who are married and not pregnant will visit her and share a bowl of aceda. First the pregnant woman eats from it, then the other women spread some aceda on her tummy, and eat of the aceda. This rite is also supposed to bring good luck and fertility (cf. Dirar 1993: 123f).

Special Occasions in Households in El Obeid

The meals served for special occasions in El Obeid follow typical urban norms. Apart from typical urban dishes traditional food like aceda and kisra with mulah are very important too. Even though most dishes served for special occasions do not differ significantly from every day food, the number of dishes served increases notably. Breakfast on special days has to contain at least five different dishes. In El Obeid one of the dishes usually is aceda with mulah as it is the traditional dish of western Sudan. Aceda has to be accompanied by a sweet dish. The other dishes are usually typically urban dishes such as ful, salad, tamia, sheia, or cheese.

For lunch at least seven[142] dishes have to be served. Tabikh is the central dish of the meal. Moreover, kisra with mulah is a standard for special occasions. Apart from that the other dishes, e.g. geema, kebab, mashi, kufta, macaroni, salata aswad, and salad can vary according to preferences and availability. This not only applies to Fridays and regular religious celebrations but also to occasions like weddings, name givings, and circumcisions. Nevertheless, depending on the number of visitors in such cases the amounts of food will be much bigger and sometimes even animals are slaughtered to serve a large number of guests.

Middle and upper class households, as the cases of Hiba and Mona show, strictly follow these norms. While the lunch, with an increased number of dishes and presence of kisra, shows parallels to everyday dinner, the holiday breakfast is very special. During the week the breakfast is usually kept small (usually one dish or a sandwich) and in case of working household members eaten out. By contrast, the holiday breakfast is extended with different dishes and a return to not only traditional food (aceda with mulah and a sweet dish) but also to a shared meal eaten within the family and often joined by visitors.

Figure 27: Women serving food for lunch of a big wedding[143]/ set lunch siniyas of the wedding (laham[144] (meat) with rice, kisra, mulah um-rigeiga[145], kebab, salata aswad, geema, kufta, pickles, salad, mayonnaise, tabikh bamia, mulah khudra, macaroni)

[142] It is not clear where these numbers (five and seven) come from and why they are the minimum standard. It can only be guessed that they developed from the addition of most common dishes eaten at the meals.

[143] The food for this wedding with more than 200 guests was prepared several days in advance by hired stuff. While all the cooking and also washing up was done by paid workers (male and female) the setting of the food was done by female relatives and friends of the bride and groom. While the women put the food on the plates it where male relatives and friends who organised the setting of the siniya by telling the women what kind of food was needed, taking the filled plates to the siniya and making sure every sinya contained each dish. Then the set siniyas where picked up by male wedding guest to serve the others. During the wedding celebration male and female guest not only celebrate in separate rooms or parts of the property it is also a tradition at weddings that the male visitors are served first, while the female visitors will get food when the men have been served.

[144] Laham means meat. This is a dish of a big piece of roasted meat and substitutes the slaughtering of an animal. As the wedding was very big it would have been a big afford to slaughter enough animals. Therefore, the meat was severed that way.

Lower income households also show different food patterns for special occasion. Nevertheless, they usually are not able to practice the same customs on a regular basis like households with higher income. As their everyday food differs significantly from the urban middle and upper class they aim to prepare typical urban dishes at least for special occasions. Nevertheless, this will be much more moderate and usually limited to one ore two additional dishes, sometimes containing meat. Amel's and Lubna's families for example prepare tabikh and one ore two additional dishes for special occasions. The number of these occasions is limited and by far not every Friday. Amna's family, who practices every Friday as special occasion, even in that case sticks to traditional main dishes as they never eat tabikh but always kisra and mulah. Even though the main food on special occasions is very traditional urban characteristics become obvious through the increasing number of dishes usually by adding a second mulah and one or two simple urban dishes (macaroni or geema). In case of Zuheir's families special occasions are very rare and only celebrated by having a thicker mulah containing a little more meat.

No matter if the households practice special occasions on a regular basis or more rarely, it is on one hand the 'urbanisation' of lunch/ dinner by increasing the meat consumption and the number of dishes and on the other hand the return to the traditional breakfast of aceda with mulah accompanied by a sweet dish.

13.2.7 Perception of Diet and Individual Preferences

Talking about the perception of people's diet and their preferences is a very intimate topic. It is impossible to generalise any statements because they are very subjective and depend not only on the socio-cultural and economic background but also on the personal ideology, attitude, aesthetics, and taste. Every person judges and categorises food and food habits differently and does so under different aspects. For one person a certain dish, meal, or diet might be sufficient, healthy, and tasty and for another person it is not. For example, Lubna and Amna are satisfied with their families' eating habits and say their diet is sufficient. They eat what they like and they have enough to eat. However, if they compare their families' diet to the one of higher income families they say their families are poor and the diet is not sufficient since they hardly eat any tabikh or meat. That would probably be also the opinion of urban middle and upper class households because the daily consumption of meat and tabikh is a very important urban standard and symbol of well-being and sufficiency.

The actual consumed food does not automatically fit the preferences of people. This may be because of lacking availability, cost, or social courtesy. When preferred food is not available or affordable people choose an alternative product, which they are willing to eat and like even if they prefer something different. People might even eat food they dislike if they have no other economic choice or have to stick to social norms. This could actually be observed in

[145] The serving of mulah um-rigeiga is a absolutely must and seen as return to the tradition of the ancestors and a simple diet. It is also a bond to connect with the poor and show that in front of Allah all people are the same.

most cases. Amna and Lubna are satisfied with their families' diet but would prefer to eat more meat. Sometimes Lubna even substitutes meat by other products to cook urban dishes (e.g. mashi with peanut butter instead of minced meat). The examples of Amel's and Zuheir's families show that people cannot fit their diets according to their preferences because of their economic situation. The food they eat is not food they prefer but they can afford. Both families show preferences to an increased consumption of meat and oil accompanied with the preparation of urban dishes. While Amna and Lubna still think that their diet is at least sufficient and they eat food they like, Amel and Zuheir judge the nutritional situation of their families as bad and insufficient and cannot satisfy their preferences and likes. Mona's and Hiba's family are in the economic position that they can follow their food preferences and they do so to a big extent. Nevertheless, the case of Hiba shows that the diet of the family is also determined by social norms. Hiba would prefer to cook less oily and meat-containing dishes but social standards bound her to certain dishes such as tabikh. She herself thinks that the urban Sudanese cuisine is sufficient but not very healthy (containing too much oil and meat) and that there is made too much fuss about the cooking. Therefore, she tries to integrate her preferences into the urban cuisine as much as possible but without breaking any social standards. In Mona's case the family follows the preferences of the children. Even if Mona would prefer a more traditional diet (kisra and tabikh) and traditional 'table' manners she prepares the food her children want to eat and lets them also eat it in the way they prefer it (sandwiches).

Asking people of different generations made clear that younger generations prefer urban dishes that contain meat and a lot of oil (geema, mashi, roasted meat), as well as bread. The different urban dishes in combination with bread are not only preferred because of the high contents of meat or because of being rich in energy but much more because of giving the eater more variation and flexibility in their daily diet. Many younger people still like traditional food like kisra and mulah. For them traditional food is more suitable for holidays and special occasions. By contrast older generations, no matter if they have lived in El Obeid for many generations do prefer aceda and kisra with mulah or tabikh for daily consumption. Meat and oil play also an important part in the diet as they are understood as healthy and present prestige. It can be said, that the different generations prefer the food they grew up with.

Traditions and traditional food are very important in the Sudanese culture especially on special occasions. Traditional food habits actually are a must for special occasion since they reflect the Sudanese culture and the people's identity. Even though many people think that aceda and kisra are healthy and make strong and they are important elements in the Sudanese culture, more and more urban people prefer bread. Interestingly many people say that bread is healthy – as healthy as aceda and kisra. However, the biggest advantage of bread is for many its convenience.

Meat is also very important for the urban food habits. It is a central element in the urban diet and many people say a sufficient, good, and healthy meal has to contain meat. In urban areas meat and oil (rich in energy and protein) are categorised as healthy food which gives the body strength. In low-income households it is an achievement to be able to eat meat (whether as mulah or tabikh) on a daily basis. Many of these families buy meat if they have some extra

money. For middle and upper class families a proper meal (usually lunch) has to contain meat, otherwise it is incomplete.

13.2.8 Food Habits and Gender Relations

Labour division and gender relations concerning the food habits in El Obeid show clear structures due to given norms, rules, and traditions. Even though these gender relations can be generalised the cases have shown that there also occur some variations due to individual behaviour, perceptions, attitudes, ethnic background, age, and strata.

The urban norms in El Obeid have a much stricter division of a public male and a private female sphere than many areas in rural Kordofan where it is quite common that women are active in public[146]. In El Obeid traditionally the male head of the family is responsible to provide the family with food and shelter. He is responsible to provide the money for food and food related items and do the main part of shopping. The woman is the housekeeper and food distributor within the family. Nonetheless, the cases have shown some variations. In low-income families women often contribute to the family income and do food shopping from their own money. The deviations from the given norm are mostly conscious behaviour and people are aware that they cross borders. But the activities are justified with their necessity to secure the outcome of the family. This is also the reason why such behaviour is accepted socially. Under optimised conditions women often would prefer to stick the social norms and would be expected to do so.

This behaviour has to be distinguished from that of working middle- and upper-class women. Low-income households depend on the additional income of female family members and their shopping activities. Therefore, this behaviour cannot be understood as an appropriation of the male or public sphere as it might be in cases of some young middle- and upper-class women (cf. cases of Hiba and Mona). Especially unmarried women from better-off families consider their income generating and food procuring activities outside the house as part of their modern way of life. While female income-generating activities are increasingly accepted, food shopping is still a male task. Especially for married women in families where the male income can cover the living expenses food shopping is a clear crossing of gender borders. This behaviour might even bring the woman's husband and family into disrepute.

The small food shopping at the nearby shop is often done by women and male or female children. If the children are at home, they are sent preferably. So the mother does not have to stop her activities at home (e.g. cooking, serving guests). Furthermore, the woman does not have to get properly dressed for public. Even though small shopping done by women is socially accepted, and in some cases seen as a social and communicative event (cf. Nageeb 2004), for many women from all strata staying home and following their traditional roles is seen as a privilege. It can be assumed that female household members are willing to do the shopping

[146] This has at least two reasons. One is the influence from the Nile Valley culture through the traders in El Obeid. The other reason is the Islamisation. (see also reference 149)

when their daily activities take place in the public and they have already left the private sphere.

Even though it is the man's role to provide the money for food and do the main part of shopping, the woman usually decides what is bought. This is due to the fact that the woman is responsible for the family's diet. As soon as the man hands over the food to the woman, he also hands over the control of it. All ingredients stored are the sovereignty and the property of the woman. She controls them and decides on the use. It is the task of the mother to deal with the products and ingredients responsibly to provide sufficient meals for the family. The food preparation is exclusively done by the woman, often assisted by teenage or adult daughters. The kitchen is, in the sense of tasks, skills, knowledge, and status, a woman's place and socially food preparing activities are not accepted to be carried out by men. According to strata and age the only variations may occur in the preparation process as younger women tend to prefer modern cooking facilities.

Only in case of slaughtering animals men get involved in food processing. This is connected to religious rituals. Women and non- circumcised boys are not allowed to slaughter an animal. As the procedure of slaughtering is a rite every action has to follow the rules. The slaughtering, skinning, gutting, and cutting of the animal are exclusively done by men. They also prepare the gut parts, which are eaten raw, by spicing them. The men also roast some of the meat on embers. Even though the men prepare some of the meat and guts the main preparation of the meat is done by the women. They usually roast the meat in a pan and cook the guts into a soup.

The serving of meals is done by female and male family members. The meals are eaten together as long as no guests are present. In case of guests or special events it is common to eat separated by gender.

Mainly women cross that borders by becoming active in public life. That might be argued with the fact that their actions become visible that way. Nonetheless, it could not be observed that men enter female (invisible) spheres in the private spaces. While women are socially accepted to take over 'male' activities under certain conditions, men do not follow women's activities as this would be socially unacceptable in any circumstance.

13.3 Dynamics of Food Habits and Transformation of Social Structures in El Obeid

13.3.1 Changes of the Food Habits and in the Consumption Behaviour

Natural and socio-cultural factors have a great impact on what people eat, how they prepare and consume food, and what kind of food they prefer. The individual food habits are usually already determined during the childhood. People tend to like the food their mothers cooked when they were children. Nonetheless, food habits are not static. They change, as consequence of shifting natural and socio-cultural environments which may be caused by ecological transformation, technological progress, the transfer of knowledge and skills, economic development, political decisions making, or introduction of new ideologies.

Worldwide the food consumption of the urban population shows certain characteristics. Even if every place has its own very special features according to the natural and socio-cultural environment there are certain trends and similarities which can be observed in many towns and cities. In urban societies with a higher purchasing power or more urbanised countries less grain is consumed whereas the demand for meat, vegetables, and fruit is higher. In countries with lower purchasing power the urban population more likely changes the diet within the grain group (to rice and wheat) still consuming big amounts of cereals (Brown and McCalla 2005, Hesse 2002, Maxwell et al. 2000). Nevertheless, with an increasing purchasing power and an improving social status the food patterns change to more expensive food products. Especially the expenditures for meat, vegetables, protein-, energy-, and sugar-rich food increase while the consumption of cereal products decreases (Brown and McCalla 2005, den Hartog and van Staveren 1995, Elwert-Kretschmer 2001, 2005, Maxwell et al. 2000, von Braun et al. 1998). Even if the nutritional status improves with a rising income in the end the status of consuming certain prestigious food is often of even greater importance (den Hartog and van Staveren 1995, FAO 1997b).

The dynamics of the food habits in El Obeid show two tendencies. One is the change from rural to urban food patterns and the other one is the change between the generations. Both trends are often overlapping and simultaneous. The processes of changes are influenced by many different internal and external factors. Environmental influences, macro-economic and political decisions, development of knowledge and technology, social and religious structures and norms, economic situation of households, and individual behaviours and preferences embedded in space and time can cause changes of the food habits and consumption behaviour. The different cases showed that the changes affect all food related processes as the supply and demand, the meal preparation, the kind and number of dishes, and the way of carrying out meals. Interestingly, the structure of the changes in El Obeid is quite similar to the majority of ethnic groups. Ethnic varying habits uniform to set urban standards which apply to all social and ethnical groups. This could be interpreted as unification and standardisation of food habits and loss of cultural and ethnic characteristics.

Rural-Urban Changes

Traditionally millet (*dukhun*) was the main cereal consumed in North Kordofan. It was used for aceda and was eaten with mulah for all meals every day. Up to date many rural people prefer millet to sorghum (*durra*). This is not only because millet grows better than sorghum in the dry and hot climate with uneven rains but also because of its taste and nutrition. People in North Kordofan believe that millet has a higher nutritive value. Eating aceda made from millet gives them more energy and power and fills the stomach much longer than aceda made from sorghum. By contrast, sorghum is seen as food of less value and was usually given to animals or was eaten in years of bad harvests. In western Sudan people in rural areas believe that people are well-off if they eat millet. If they eat sorghum, they have to be very poor because they eat animal fodder.

> "The ideal, which only the wealthier households satisfy, is to eat millet throughout the year either from the family's own stocks or from purchases from village merchants. Farmers that are less well

> off are compelled to buy feterita [sorghum] at least for the dry season in order to save their millet for rainy season consumption. The general belief is that feterita is "light" (khafiif) and "cold" (baarid) making it an undesirable food for the rainy season, a time when farmers are engaged in the heavy labour of weeding their fields. For this work they need a "heavy" (tagiil), "hot" (sukhun) staple, which millet is, to give them the strength to work hard. During the rainy season, too, when meat is not affordable due to the farmer's low purchasing power, millet asida can be eaten with oil rather than a meat sauce because it is filling, high in fiber, and good tasting. Feterita, on the other hand, is so bland that villagers prefer to eat it with a meat sauce for flavour." (Reeves and Frankenberger 1982: 75 in Theis 1999: 95)

This preference of millet also characterises the diet of North Kordofan and western Sudan. Millet is very suitable to prepare aceda. It gives a nice yellowish colour, a slightly sweet taste, and a firm and smooth texture. On the other hand millet is not very suitable to prepare kisra. Kisra from millet will have a crumbly viscosity instead of giving elastic sheets. Hence, traditionally aceda is the preferred main dish in North Kordofan, while kisra is more common in the regions of the Nile Valley and eastern Sudan where sorghum is the main cereal.

With the 1960s when the rainfall started to decrease and the yields of millet got lower people were forced to change their diet from millet to sorghum which was cheaper and better available[147]. This not only meant that many people had to eat 'the grain of the poor' but also increased the consumption of kisra.

Concerning the rural – urban movement the food consumption is separated from food production, hence the food supply changes from subsistence farming to a dependence on income generation to purchase food. This means also a dependence on market supply and at the same time a wider choice of food products and possibilities as the urban market offers a variety of local and non-local products. This not automatically leads to new food habits but ingredients for the usual dishes might be substituted because the known ones might be no longer available. This can cause an accommodation or mixing of the different habits. The cases of Zuheir and Amel showed that urbanisation and with it the dependence on an income and the market supply can be a step backwards if the income of the household is low and the living expenses and prices of food products in the town are higher than in rural areas. This affects the household's diet drastically because food of less quantity and quality is available. Even if the rural diet might have been quite monotonous with two meals a day consisting of aceda/ kisra with mulah the urban diet might be even more moderate.

While the food supply and procurement change with urbanisation the food preparation methods do not necessarily change. In many households in El Obeid it is still common to cook with a wood or a charcoal fire and women preparing the similar food the similar way as in rural areas. Nonetheless, pre-processed products (e.g. flour, minced meat, or oil) available in town may ease preparation processes and change dishes asking for a different preparation process.

[147] In El Obeid central market 3 kg of sorghum (feterita) cost SP2,000, 3 kg of millet cost SP4,000, 3 kg of wheat would cost SP5,000 (spring 2005).

Concerning the dishes and meals in rural Kordofan traditionally aceda with mulah is eaten for breakfast and lunch. In the past, even several years after the independence (1956), it was common in El Obeid to eat aceda with mulah and a sweet dish for breakfast too. Occasionally ful and bread were eaten as well but it was not as popular as it is today. The most obvious rural-urban changes of dishes expresses in lunch with the consumption of kisra instead of aceda and depending on the income the increasing consumption of meat, oil, and vegetables often connected to the change from mulah to tabikh[148]. It might have occurred that additionally to kisra with sauce one or two other urban dishes were consumed. Having a third meal a day depended, like today, on the income and preferences of the family. The supper could have been a thin porridge, aceda with mulah, sweet pasta, or milk. Generally, the typical urban diet in Sudan has very strong Turkish and Egyptian characteristics. Most of the urban dishes were introduced to Sudan during the Turko-Egyptian period (1821 - 1885) when the towns started to grow. The cuisine was first introduced to the Nile Valley where sorghum hence, kisra is the staple and spread to the western towns with the traders[149]. Even if dishes like kisra and tabikh are not originally Sudanese they have been part of the urban culture in Kordofan for such a

[148] The change from aceda to kisra might already appear in rural areas. More significantly is the change from mulah to tabikh. Tabikh is not found in rural areas of Kordofan on a daily level as the ingredients are hardly available but is a very typical urban dish.

[149] This is not only a cultural influence but an ideological and political change of the Kordofanian society. Originally the Kordofanian culture was dominated by nomadic and rural traditions which reflected in lifestyle like clothes, food, social behaviour, and the religious and ideological attitudes. The people lived a simple life and preferred simple clothes and simple food. Aceda from millet and milk were the staples and provided most of the food a rural person desired (Beck 1998, Hesse 2002). The esteem of the self-produced food included a number of rites and celebrations which strengthened the social community and identity (e.g. offering marissa for celebrations, guests and labourer) (cf. Hesse 2002: 275-280, Theis 1999). With the settlement of Nile Valley traders in El Obeid at the beginning of the last century the ideological attitude of them being more civilised than the nomadic and rural population was increasingly spread. While the habits, lifestyle, and ideology of the trader and migrants from the Nile Valley was seen as varied, extravagant, clean, strict, and Islamic, the whole lifestyle (including clothes, housing, religion, and food habits) of the indigenous people was understood as monotonous, simple, poor, untidy, and un-Islamic. The food habits were just one part of a whole concept which embodied a certain status, mentality, and ideology. With the starting Islamisation in the early 1980s this ideology was even strengthened. The government and elite spread what they called 'the high culture' of the Nile Valley all over the country. Up to date the Nile Valley for the elite represents the economic and political centre of Sudan and claims cultural hegemony.

The Kordofanians have always been religious but their belief in magic did not correspond with the Islamic attitude. There had already been strict religious rules since the Mahdi but the aim of the Islamisation was a social restructuring in terms of the 'Islamic Revolution' (Beck 1998). The goal is the elimination of cultural variety in local communities and the creation of an uniform Islamic culture which roots can actually be seen in the Mahdiyya. Islamisation led to a cultural and social change in clothes, food habits, moral, behaviour, and lifestyle. The way of life and culture of the urban and settled population is understood as the ultimate one while nomads do not fit in the ideology of the elite. "Educated market folk stress abstinence from alcohol and chewing tobacco in their way of life; they accuse the nomads of eating unclean food and drinking millet beer, of not living according to proper Islamic order and, finally, of not serving God but rather their animals. Basically, they regard the nomads themselves as animals who vegetate in filth and ignorance out in the bush, without order, civilisation, and the regulations of Islam" (Beck 1998:271). After the drought in the mid 1980s it was seen as a positive effect that many nomads had to settle because they lost huge numbers of livestock (Beck 1998). It is also believed that the nomadic tribes would not have survived the famines and that only the feeding programmes in the urban areas and food camps saved the lives of many of them. This also stresses the thinking of the superiority of the traders and urban population.

long time that they are seen as traditional. Therefore, it could be said that in Kordofan kisra with tabikh are historically seen as common urban food.

Generational Changes

The change of food patterns between the urban generations has an obvious trend of moving away from the traditional habits. While the change from rural to urban food habits still shows similar eating behaviour between both sides, with the generational changes significant transformations of the food habits occur. Apart from a drastically changing market supply offering more and more imported and processed food products, the spread of modern storage technologies like refrigerator and preparation facilities lead to new opportunities in the storage, processing, and preparation. Especially households of younger generations increasingly make use of new technologies. While the preparation process itself through urbanisation had not necessarily to change younger women prefer to use gas stoves instead of the kanon or the wood fire. This can mainly be observed in household where the young women are working as the cases of Hiba and Mona showed.

Today an increasing number of women in El Obeid join the procurement of food not only by buying it but also by earning money for food shopping. Nonetheless, there are clear differences between ethnics and even more obvious ones between strata. In many low-income households women have to earn money and do the shopping to secure the livelihood of the family while many younger middle- and upper-class women would not have to do so but do it because of their attitudes. Many of them with daily activities in the public sector not only do food shopping from their own money but also prefer to fit the food preparation to their lifestyle. This not only leads to new cooking methods but also to a change of preparation, dishes, and diet. Cooking for many working women is not the most important activity of the day anymore as it might have been for their mothers who where housewives. As their time for food preparation is limited they prefer to make dishes or practise cooking methods which do not take much time. Dishes with a time-consuming preparation like kisra or aceda are eaten mainly on a daily basis in households where the mother or another female household member spend some time at home as the cases of Amna, Amel, Lubna, and Zuheir showed. In households with working mothers staples are preferred which are easy and fast to prepare like pasta and rice or ready to eat like bread. This automatically leads to the replacement of mulah through tabikh since mulah is not eaten with bread. Moreover, the dishes are often prepared in bigger amounts lasting several days which reduces the preparation time. Younger women find it more comfortable to cook with gas instead with wood or charcoal. It saves time as they do not have to light a fire, it is cleaner and the food cooks faster. Even though the time factor has a significant impact on the food preparation of working women, paradoxical the kind and number of urban dishes that have to be served for the daily meals take much more preparation time than a traditional rural meal. As the types of food and the norms changed over generations also the preparation effort increased.

With the reduction of the preparation process and the increased consumption of convenience and street food the direct connection to the food itself and the meals get lost. There already is an estrangement from the food product when it is just bought and the process of growing the

food and taking care of the plant/ animal is left out. The transformation of the food product in a culturally determined meal is a very important socio-cultural process which includes a large number of symbols, rites, and norms. Usually cooking skills including the knowledge, norms, traditions, and identity are passed on from mothers to daughters and can be seen as a cultural reproduction. This process already starts during early childhood at home. With urbanisation this transfer faces serious problems because mothers and daughters may pursue daily activities outside home so the time available to learn cooking is limited while the preparation process may be reduced. Omitting the procedure of creating a meal in favour of the use of new technologies as well as uniform and processed product means also to give up and to loose a piece of one's own culture, knowledge, skills, identity, and individuality.

Apart from a changing food supply and preparation, the generational change becomes significant through the alteration of dishes and consumption patterns. In case of breakfast the consumption of aceda (sorghum/millet) with mulah changes to bread (wheat) and ful and in case of dinner the change is from kisra (sorghum) with tabikh/ mulah to bread/ kisra with tabikh accompanied by other urban dishes. This change continues with disappearance of traditional staples like kisra and aceda with sauce and its replacement with bread which is also closely connected with the increasing consumption of other dishes and especially sandwiches and convenience food. This does not only mean a change of the dishes but also reflecting transformations in the meal preparation and consumption behaviour.

Aceda eaten with mulah as the traditional rural staple also used to be the urban breakfast in many cases just one or two generations ago. Today ful eaten with bread is the most popular breakfast in El Obeid - whether having it at home or eating out. In all introduced cases aceda for breakfast is only consumed for special occasions, on holidays, or in the case of visitors. Even in that case ful also has to be part of the breakfast. As many people work during the week most of them have their breakfast out which also increases the consumption of fast food like sandwiches. This shows that not only the dishes for breakfast changed but many families do not eat breakfast together during the week.

As aceda for breakfast kisra – the staple that in the beginning replaced aceda for lunch with the process of urbanisation - is of decreasing importance for the daily urban lunch. Even if it is quite common in El Obeid to eat kisra many households consume it on Fridays or holidays only. Today, tabikh is the dish that sets the urban norm which is increasingly eaten with bread. Additionally, urban households have to serve a certain number of other urban dishes (e.g. geema, mashi, kufta, pasta, salata aswad, kebab, salad) for lunch to fulfil the standard. As these other dishes cannot be eaten with kisra, bread is even more indispensable to the urban lunch.

This means that the traditional grains millet and sorghum are of decreasing importance while wheat becomes the main cereal in Sudanese towns and cities which is cohere with the typical urban consumption patterns.

> "The consumption of aceda in the larger towns has practically disappeared, being replaced by the consumption of western wheat bread and kissra sheets. In a limited survey, carried out in two towns of eastern Sudan, it was found that 74 percent of the families in Kassala and Port Sudan towns ate

> wheat bread, 24 percent ate kissra sheets and only 2 percent ate aceda. In Khartoum, Central Sudan, the corresponding figures were 69 percent for western wheat bread, 31 percent for kissra and nil for aceda." (Dirar 1993: 120)

Status of Urban Food

The increasing consumption of bread and analogous the growing consumption of meat which is an important ingredients in most of the urban dishes are closely connected to rising incomes. Traditionally, meat was only consumed on special occasions. However, since the introduction of commercialised butchers in the late 1960s meat is available for everyday use in bigger villages and towns. The consumption of meat is a symbol of high status and prosperity. Its consumption symbolises for many the ascent into the urban middle class.

That means that with the process of urbanisation and changing lifestyle in towns food develops a new social function as certain products and dishes express a certain social status. In the past people in rural areas of all different strata usually ate the same dishes and meals depending on the area and tribe. The meals of the different social classes distinguished not so much in what was eaten than how much of it and how often it was consumed[150] (de Waal 1991, cf. Tothill 1948b: 212). Hence, a better-off rural family ate aceda with mulah, like a poorer family. It might have been the grain for aceda or the mulah that had made the difference as it might contain more or less nutritious ingredients. A better-off family probably had a bigger amount of food available, or had up to three daily meals but generally it was the same staple food as the kind of food supply was the same and the dishes themselves were no status symbols. Even if eating meat was of high status its consumption was an exception to the daily diet as it was a food reserved for special occasions. With urbanisation certain dishes are understood as the expression of social status. Certain social classes consume certain kind of food and specific dishes. To consume a certain dish on a daily basis is seen as the reflection of the status. For example, the daily consumption of tabikh (meat) expresses an urban standard. By contrast, not eating tabikh is a sign of poverty. The same applies to the consumption of bread. The daily eating of bread expresses modern urban life while the daily consumption of kisra and aceda is understood as rural and poor.

The increasing meat consumption and the big range of products offered in the markets day by day reduce the differences between the daily diet and meals on special occasions and therefore change the meaning of food. Rituals and traditions often disappear as soon as the consumption of a certain product or behaviour becomes normal on a daily base. For example, food like meat traditionally was reserved for celebrations and the slaughtering and its preparation followed strict rites and norms. Today the slaughtering is done in a commercial way and is sold in nicely chopped pieces ready to prepare. Even if meat still reflects high status today it can be bought whenever desired which makes its consumption much easier and decreases

[150] Tothill (1948b: 210-221) summarises the nutritive situation of different households in a pump irrigated region in riverian lands north of Khartoum. This research shows that the main meals of the household consisted of kisra with mulah not depending on the economic situation of the family. The strata distinguish by having one, two, or even three meals a day.

its special character. today the special occasions mainly differ from daily meal by the range and quantity of served dishes.

Also connected to the consumption of bread is the increasing demand for grain legumes. Ful containing plenty of oil eaten and with bread can be seen as the replacement of aceda with mulah for breakfast. Chickpeas in form of tamia as well as lentils are also very common in the urban cuisine. Moreover, there are changes in the consumption of dairy products. Dairy products are very important in the Sudanese food culture but with urbanisation and especially within the last few decades the range of dairy products totally changed. In urban areas especially industrial dairy products are consumed which were not known in rural areas for a long time. Yoghurt, white cheese, and dried milk powder are very common in Sudanese towns while traditional homemade products like rob and samin are of decreasing importance.

Summarising, with the rural-urban and especially with the generational change not only replacements within the different food groups can be observed but also a shift between the food groups. The consumption of cereals decreases while the share of meat, vegetables, legumes, oil, and sugar rises[151]. But the extensive, energy- and protein-rich urban cuisine is left to the one who can afford it. Low-income households consume cheaper urban food like bread, ful[152], or tomatoes for breakfast. Even in case of rural migrant they change from their rural diet (often aceda with mulah) to reasonable urban food as they cannot afford two hot meals a day. For lunch they cannot follow the urban norm of serving a certain number of dishes of which one has to be tabikh. Their lunch is much more moderate; in many cases still consists of traditional rural dishes like aceda but mainly kisra with mulah. These families as in the case of Amel and Lubna might prepare tabikh and one or two other dishes for special occasion and eat it with kisra or bread. The traditional dishes (aceda/ kisra with mulah) more and more become the food of the poor, who cannot afford expensive urban food[153].

Shifting Structures of the Meal and Social Changes

A large share of the urban population is pursuing daily activities outside home therefore the daily diet is accommodated to the daily routine. The working population, students, and schoolchildren usually eat their breakfast out away from home. Some might take their own

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[151] According to the Engel's law the share of cereals and the proportion of the income that is spend on food products decreases with an increasing income, as several studies also have shown (Den Hartog et al. 1995, Elwert-Kretschmer 2001, Maxwell et al. 2000, von Braun et al. 1998). Nevertheless, with an increasing income the absolute amount spend on food rises. With it the consumption of staples (cereal products) decreases and the consumption of expensive foods like meat, dairy products, vegetables, oil, and sugar increases.

[152] The price in this case is relative. Buying bread and ful might be on the first sight more expensive than the ingredients for kisra and mulah, but as they are ready to eat no money has to be spent on fuel and no time on cooking.

[153] This has an obvious analogy to the social distinction of the food habits from the antiquity until the modern Europe until after 1945. Porridges, polentas, and stews (similar to aceda/ kisra with mulah) were the food of the poor while bread and separated dishes were consumed by the rich. With increasing incomes, improving food production and supply (respectively decreasing prices), and occupational changes lower income groups shifted their diets to bread as a staple away from porridges and polentas. Even if low-income households in El Obeid consume bread, their main meal mainly consists of traditional porridge-like staples and in its character it is comparable to a stew.

snack from home but many are eating out by make use of street food which is very popular in El Obeid. Especially in town centres or in the area of markets many street restaurants and snack stalls offer different dishes. The most common dishes are ful, tamia sandwiches, and burger. On one side street food provides the chance of a quick and reasonable food supply with high-energy and protein-rich food. Ful or a sandwich is usually available for about SP1,000 to SP2,000. On the other side the food consumed outside home is not necessarily of superior quality. Food safety is a growing concern and there are hardly any control mechanisms for the quality of the food and hygienic condition of the restaurants and kiosks. In case of frequent consumption street food also bears a high health risk as it is an insufficient unbalanced diet.

While adults often prefer a shared breakfast of ful with colleagues, especially younger generations prefer sandwiches as they offer them a more freedom, flexibility, and choice compared to a bowl of a shared dish. Nevertheless, for households with a lower income the consumption of fast food is not affordable. The above cases of families in El Obeid showed that often the shared meal at home of traditional products like kisra and aceda with mulah is more reasonable.

All these changes show that not only dishes, preparation, and consumption patterns but also the structure and with it the meaning of the proper meal – the main meal itself transforms. Traditionally the bowl of the staple (aceda/ kisra) including the garnishing (mulah/ tabikh) built the centre of the meal not only by being the main dish but also by being placed in the middle of the siniya. The staple on its own without garnishing would be incomplete as the garnishing would be incomplete without the staple. That means that only staple and garnishing in combination are a proper meal. The staple supplies the feeding basis and the garnishing the flavour (and from a physiological point of view additional nutrients). Hence, the garnishing (mulah or tabikh) is an essential part of the staple as well as of the proper meal. With the process of urbanisation the traditional staple (aceda/ kisra with mulah/ tabikh as one unit) disappears not only from the centre of the meal, but also the staple as the symbolic centre of the diet and of the food culture vanishes. While in the old structure staple and garnishing built a dependent unit - a complete combined dish; in the new setting each dish is independent from the other. In the new structure several dishes are placed on the siniya and the new staple bread is placed on the edge. Even though tabikh becomes a status it does not necessarily moves into the centre of the meal. This place can also be occupied by another prestigious dish which now is presented as the core – the most important dish - of the meal without containing a staple. The new structure of a proper meal is now determined by the number and combination of served dishes and not focused on the centre of a staple. That means that just one urban dish with the staple would not make a proper meal. Even if the dishes are independent and are not eaten mixed, only the serving of different dishes and the staple on the siniya makes a proper meal. Meanwhile, the staple (bread) is pushed out of the centre as all the presented dishes are eaten with it and analogues it only can be eaten with another dish. With the increasing consumption of sandwiches and snacks, the structure of the meal will be finally destroyed as such kinds of food are culturally seen no proper meals.

The change from the central staple to the garnishing or side dishes can mainly be observed with class differences. While lower-income households stick to a feeding staple including a garnishing but hardly any side dishes, in middle- and upper-class households the staple (without garnishing) becomes a side dishes while garnishing and side dishes move into the heart of the meal[154].

The changing of the food habits and structure of the meal in El Obeid are closely connected to changing social and cultural structures.

Furthermore, the case of El Obeid showed that the changing meal structure cohere with changing social/ family structures. Traditionally structured meals of a staple including a garnishing can be seen as a symbol for the common eating group/ the unit of the family sharing the meal and building a social basis. The disappearance of the staple from the centre, the vanishing centred structure and especially of the loss of the meal itself symbolises the decline of social structure and the decreasing importance of the family as a social basis. The traditional extended family with the concept of set meal times and the shared meal at home is likely to make place for the nuclear living unit with flexible eating times as an individual event. The disintegration of the common eating group includes eating out and individual eating at home. The shared breakfast at home during the week has disappeared for a long time and is in many household a ceremony reserved for holidays. While the shared lunch at home still has a high status in El Obeid more and more households only practice shared meals on holidays. The individual eating at home is not very common, compared to eating out, as long as the family members are at home for a meal. Nevertheless, the case of Mona's children showed that there might be a starting trend for it; especially, as the urban cuisine offers many the possibilities of consuming bread as sandwiches.

The loss of consumption patterns such as the shared meal leads to changes of the social behaviour. The reduction of meals eaten together does not only mean the loss of the communication platform within the family but can also be a loss of the social network and cultural and group identity which all are essential social institutions. This makes the traditional meals on special occasions even more important to maintain the family network and support the community and communication within the family and create cultural identity. Nonetheless, the urban lifestyle and daily activities also create new eating groups outside the homes as the shared eating of ful with friends and colleagues in street restaurants demonstrates. However, an increasing supply of sandwiches and the offering of street food in single servings may also lead to the disappearance of these groups.

13.3.2 Bread – A New Experience of Life

One of the most significant changes of the Sudanese diet over the last few decades is the increasing consumption of wheat products, especially bread. The consumption of bread not only

[154] cf. Barlösius 1999: 125-141

demonstrated the variety of effects on the food habits but also the impact of socio-cultural factors and the relatively insignificance of natural influences for the human diet.

While the annual per capita consumption of wheat in the 1960s ranged around 10 kg it rose to about 40 kg by 2002 (FAOStat 2006). Wheat is not a new food product in Sudan. It has been grown in the northern regions for many centuries and has been part of the daily diet there. In the rest of the country wheat was neither grown nor consumed. The reasons for the increasing wheat consumption can be found in the ongoing urbanisation (Andrae and Beckman 1985, Mohamed 2001, Dirar 1993), in the political decision-making of different Sudanese governments (Dirar 1993, Oesterdiekhoff 1991, El Moula 1994, Shuttleworth 1991), and in the agricultural politics of many countries which have a surplus production of wheat[155].

After the independence of Sudan wheat has been a strategic crop for many decades. The government had the illusion that the country could become self-sufficient in wheat production, to satisfy the increasing demand of the urban population without any consideration for the production cost, economic, cultural, social, and environmental effects. The goal was to become independent of the world market by producing enough food within the country and to reduce wheat imports (Dirar 1993, El Moula 1994, Maxwell 1991b, Oesterdiekhoff 1991) and at the same time to make wheat into the strategic staple of the urban population (Maxwell 1991b). This was more an ideological strategy than an economic. When developing the domestic food processing industry it is easier to adapt already developed and internationally standardised technologies (Andrae and Beckman 1985). However, in Sudan the production costs of wheat do not stand in any relation to the profit. The production is extremely capital-intensive. It is produced in irrigation schemes and needs many inputs like irrigation, fertilizer, pesticides, and machinery while the yield is not very satisfying at all[156]. The highly subsidised wheat production can be characterised by a gap between research and production, by poor seeding methods, inadequate land preparation, lack of inputs, and bad water management (Mohamed 2001). The illusion of reaching self-sufficiency was and is supported by foreign investment and consultants who promote technology for producing and processing wheat within Sudan. This actually reinforces the dependence on wheat imports as self-sufficiency will never be reached and the demand for wheat is pushed up rapidly through the promotion of bread. Only within the last few years the government followed some drastic reforms within the scope of SAP. In 1999 the wheat production and market were fully liberalised and all support programmes for wheat

[155] This research does not provide any further examination of the influence of the economic and political strategies of western wheat producing countries. Research on this topic is very complex and would exceed the frame of this study. Nevertheless, it has to be kept in mind that the economic and political interests of wheat surplus counties and big wheat trading companies (creating/ expanding new markets, economic and political independence, and instruments of political pressure) have a huge impact on the wheat market and the spread of bread consumption in Sudan. The availability of an urban-class diet such as wheat products and rice leads to a change of the diet and a decline of the demand for local products with serious economic, social, and cultural consequences for producers and consumers.

[156] Andrae and Beckman (1985) showed that in Nigeria of the 1970s and 1980s the motivations of national wheat production were very similar to Sudan. In the case of Nigeria the cost for the national wheat production was a manifold of the price for imported wheat. It can be presumed that this also applies for Sudan.

were abolished. The inefficiency of the wheat production was made clear by the reaction of the tenants. They cut back the production drastically (Theis 1999)[157].

The politically pushed wheat production and respective consumption can be understood as a result of the 'pro-wheat-policies' of different Sudanese governments, nutritionists, and researchers supported and influenced by western economic and political strategies. The 'pro-wheat-policies' promote the intensive concentration on wheat production to increase the demand for wheat and "change the nation from a sorghum-eating population to a wheat-eating population" (Dirar 1993: 103). The subsidies for wheat production and wheat products, and the massive imports of wheat are the main instruments which have made bread a reasonable, affordable product for everybody. Especially urban dwellers in eastern and central regions (El Moula 1994) for a long time enjoyed the price subsidies for wheat bread (Dirar 1993, Maxwell 1991b, Oesterdiekhoff 1991, Shuttleworth 1991, von Braun et al. 1998).

> "The IDS [Institute of Development Studies] food security review of 1988 noted that the cost [bread subsidy] was over SP250 million per year and that the real prices of bread relative to the main substitute, kisra, had more than halved since 1970/71. This had had the effect of shifting demand from kisra to wheat and had contributed to a trembling of wheat consumption over the same period." (Maxwell 1991c: 29)

The promotion of wheat production and consumption has to be seen very critically. The high wheat imports are a heavy burden on the foreign exchange earnings. The natural environment is not suitable to grow wheat which makes the production very expensive. Aspiring to reach self-sufficiency in wheat production devours even more foreign exchange as the technology and production inputs (e.g. seeds, fertiliser, machines, spare parts) have to be provided. The national wheat production can be seen as a massive waste of resources. It destroys traditional farmland through expansion and development of irrigation schemes and it deprives domestic food producers of their income and market power. Nevertheless, the elite of Sudan see wheat as a progressive and modern crop and food product. While sorghum is produced in the primitive rainfed agriculture with technologies out-of-date, wheat is produced with modern technology and inputs. Wheat is industrially processed and prepared (flour, bread, pasta, biscuits) while traditional crops like millet and sorghum are processed on household level and the products are not important in the commercial economy. Traditional products are mainly consumed by rural people but the modern educated Sudanese live in towns and eat bread. This attitude appears rather illogical looking at the food supply situation, the rate of malnutrition, and the high foreign debt of Sudan. It only can be assumed that the 'pro-wheat-behaviour', which understands the consumption of wheat as a modern development and economic progress, is based on a contorted social and political point of view.

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[157] The wheat production covers about one quarter to one third of the national demand. About 75 per cent of the demand is imported. To a large extent the wheat production depends on the world market mechanisms and the availability of and access to credit and production factors. It is not profitable to produce big amounts of wheat when the world market price is low because the production cost is too high. In that case it is cheaper to import wheat and the irrigation farmers shift to more lucrative cash crops like oil seeds or vegetables.

There is a direct connection between increasing wheat imports, urbanisation/ transition to non-agricultural occupations, and food shortage (cf. Andrae and Beckman 1985: 142-143). The rather cheap food imports satisfying the new food patterns of the non-agricultural population shift their demand away from domestic food. Local products will be edged out and local producers will loose their income. The domestic food might not even be of short supply but the decreasing demand will increase the price and develop real shortage. Furthermore, the extended availability of cheap imported food will lead to a decline of the number of agricultural producers which increases the dependence on the imports and endangers the domestic food production which again can induce food shortage.

The growing wheat consumption is also caused by the increasing urbanisation accompanied by a changing lifestyle and behaviour and the transition to non-agricultural occupations. The food supply of urban citizens depends on an income as the food has to be bought. As time and money are very important factors in urban lifestyle people tend to prefer food which is reasonable, easy to prepare, and convenient. In that case, bread is a perfectly fitting staple for urban dwellers and was quickly accepted[158] (Andrae and Beckman 1985, den Hartog and van Staveren 1995, Mennell et al. 1992, Goodman and Redclift 1991).

> "The extreme convenience of bread fits into the changing structure of demand generated by the emerging new patterns of working and living, namely, the ongoing break-up of the household structures with less labour available for home cooking and more people working and living outside their households at least periodically over the working day or the year." (Andrae and Beckman 1985: 20)

Bread is exclusively commercially produced, cheap, offered in many places all over the towns, and can be eaten straight away without any further preparation - a very convenient product. By contrast traditional staples like aceda and kisra are exclusively produced on household level requiring preparation time and fuel. Even if homemade kisra is sold at the market it is more expensive than bread[159] (Theis 1999). Hence, the consumption of bread is increasing on the cost of kisra and especially aceda (Ahmed 1999, Dirar 1993, Hesse 2002).

The importance of bread in urban centres is also indirectly expressed in the language. Traditionally sorghum was called 'aish' which means 'life' or 'that what keeps one alive'. Today western-style bread is called 'aish' (Dirar 1993, Hesse 2002).

Another aspect of the increasing bread consumption is a rising income. Higher income groups tend to consume bigger amounts of highly refined and bright cereal products. The colour of the food also plays an important role for the social status. Even if bright and dark coloured sorghum varieties have been known in Sudan for many centuries, the colour never had such an influence on social status like today. Usually different types of sorghum are used for different dishes not only because of its appearance but its quality. By the introduction of western-style white bread through the British, white or brightly coloured products have grown of

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[158] This is a worldwide phenomenon. In Europe bread was on the advance with the industrial revolution and these days the similar process can be observed in the progress of urbanisation in developing countries.

[159] The price difference between kisra and bread was most obvious until the late 1990s when bread was still heavily subsidised (cf. Dirar 1993: 108).

more and more importance and become a status symbol especially in the cities. Dark, brownish, and greyish products (like aceda and kisra from sorghum) are seen as 'food of the poor and rural' while bright, light coloured, and white products are understood as the 'food of the wealthy and urban' (Coen Flynn 2005, Dirar 1993, Mennell et al. 1992, Teuteberg 1972a). This makes wheat into a highly prestigious product. Urban citizens of the upper strata and the elite have developed real prejudices against sorghum. Its consumption is considered as reactionary[160]. In contrast the consumption of wheat is considered as progressive and modern.

With the changing consumption patterns and social structures there is no alternative to bread. Local products like sorghum and millet do not have the characteristics like wheat to prepare bread from it. This makes them not competitive to wheat. Apart from the processing characteristics bread is much more convenient than kisra and aceda.

The replacement of aceda and kisra through bread goes confirm with the change of dishes in urban areas (Theis 1999). With an increasing income urban households change the diet to typical urban dishes which cannot be eaten with aceda or kisra. Hence bread becomes the staple to enjoy these dishes. Analogous, if bread is consumed it is automatically eaten with urban dishes because it does not fit to traditional dishes. Hence, there is a very clear interaction between bread and urban dishes as one requires the other[161].

Bread gives its consumer a new experience of life. Bread is cheap and is ready to eat which saves the consumer time and money. It is very convenient because everything like ful, tabikh, cheese, meat, eggs, jam, and all kind of urban dishes can be eaten with it. This gives the consumer more freedom of choice. It can be eaten everywhere, at every time, and keeps the hands clean which is much more 'civilised'. Hence, compared to kisra and aceda with mulah, bread represents flexibility and freedom and fits perfectly in the way of life of modern, working urban citizens. This makes it into the essential staple for many. Especially younger people prefer bread (especially in form of sandwiches) because it comes from Europe and America. They like these modern things older generations did not have (Coen Flynn 2005). Nevertheless, the consumption of bread embedded in the urban lifestyle not only indicates flexibility, freedom, and modern life but also a loss of the traditional and regional culture, knowledge, and social values. Bread as a symbol of urbanisation and urban lifestyle reflects the (worldwide) unification and standardisation of cultural behaviour with distinctions rather between generations than between regional cultures and tribes.

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[160] The negative approach towards sorghum originates from colonial times during which the culture and traditions (and therefore the food habits too) of the indigenous people were considered as backward and primitive and were suppressed or even destroyed.

[161] This is actually one of the main reasons why urban low-income households mainly stick to traditional food like aceda and kisra with mulah. Bread is combined with other (meat, oil, and vegetable containing) dishes which preparation requires enough money. Of course even a poor urban household could afford bread with groundnut butter or tomatoes but that would is not understood as a sufficient meal because it is not cooked. Hence, for a low-income household it is much more reasonable to stick to kisra and aceda with mulah because that is a proper meal.

13.4 Constraints of Urban Meal Security

The rapid growth of the urban population in Sudan, due to high population growth rates in towns and migration, presents major challenges to the Sudanese food system. While the rural population can rely, to some extent, on subsistence production the urban population depends on an income and the food market (Brown and McCalla 2005, de Waal 1991, von Braun 1999). The increasing non-agricultural population has to be fed with a certain quality of food to maintain and improve the nutritional status of the urban people. This has consequences for the local and national food production as well as food imports (Andrae and Beckman 1985, Brown et al. 2005, den Hartog and van Staveren 1995). Even if the average worldwide agricultural productivity is high enough to feed all people, the increase of the agricultural productivity and the distribution of food is uneven (Brown and McCalla 2005). In Sudan the agricultural productivity, especially in the rainfed subsectors, is inferior, the food distribution system is insufficient, the purchasing power of the majority of the population is very low, and the rates of malnutrition are high. The rapid shift in economic activities away from agriculture causes changes in the social organisation and consumption patterns and can increase food shortage. Even if the country produces enough sorghum in good seasons, produces enough meat, and imports enough wheat it does not guarantee meal security.

The strong trend of urbanisation also has an impact on the livelihood, the way of life, and the living standard of the urban population. Increasing urban population demands for technical and social infrastructures, housing, income opportunities, and administration. Most people who migrate from rural areas into towns are poor people in hope to find better living conditions in the towns. But the population flow is unplanned and faster than the structural and economic development of the urban centres with serious affects on the urban living conditions such as health, sanitation, education, housing, labour supply, real wages, and commodity prices. Insufficient sanitation and hygiene such as polluted drinking water, contaminated food, and lacking waste management are common threats for health (Coy and Kraas 2003, Nelson 1999, Simon 2001, von Braun 1999) as well as for meal security in towns.

Urban poverty often is a neglected topic. Rural people are more likely to be identified as poor than urban dwellers because urban areas are usually better off than rural areas. Urban centres normally are politically and economically privileged because they are the residence of governments, financial institutions, and industries. Hence, market supply, technical and social infrastructures, and economic and structural development are better than in rural areas. Nevertheless, the privileges often just occur in the main town areas and are available to the urban middle and upper class. By contrast, the urban poor often live under health threatening conditions having hardly any access to urban privileges (Coy and Kraas 2003, Nelson 1999, Simon 2001, von Braun 1999). In Sudan urban areas are a good example to demonstrate that a sufficient food and commodity supply, health and education services, road and communication network not automatically guaranty food and livelihood security for everybody because many people have no access to it.

A wide range and diversity of local and imported food are available in towns. The general urban trend toward a higher consumption of meat, vegetables, and fruit is mainly caused by

the level of income. The access to food is directly bound to the monetary assets of the households. The reliance on purchased food and food-related items is a main factor for meal security of urban households. A lacking, irregular, and low income and rises of food price endanger urban meal security. As food consumption in towns is closely linked to the purchasing power, nutritional deprivation among the poor can be much greater than in rural areas. Therefore, income, price and income stability, and regular employment are very important for urban meal security. Especially for low-income groups low prices for staple food are crucial. Even if it is often criticised that subsidies of staple food do not reach the rural population, they are essential for the meal security of the urban poor. The lift of the subsidy of bread in the progress of the SAP mainly had a negative effect on the urban poor who depend on reasonable food prices (Beall et al. 1999, de Waal 1991, FAO 1997a, Maxwell et al. 2000).

Dietary habits and meal patterns are also affected by the breakdown of traditional family structures and social networks. Migrants are often marginalised and have to integrate into new social networks. Moreover, urban lifestyle leads to consumption patterns that replace the traditional common family meals which are not only an important institution for the meal security of the family but also have important social functions for the bond and spirit of households.

Part III: Résumé

Reflection of the Empirical Results on the Cycle of Meal, Conclusion, and Perspectives

14 Résumé

14.1 Reflection of the Findings on the Concept of the Cycle of Meal

The problem of food shortage and food security has been a discussion about food production, market supply, distribution, and access to food for many decades. This study showed that the food habits should be a central element of the discussion of how to close food gaps. For this food habits are defined as a complex procedure including different processes from the production of food up to the consumption of a prepared and served meal. To underline the importance of the complexity of the problem and make the matter of fact visible that food security only can be reached when the food is eaten the term 'food security' was renamed into 'meal security'.

The focus of interest of this study has been on the different ecological and socio-cultural factors that interact with the food culture of the town El Obeid in Central Sudan and to demonstrate the relevance of a holistic examination for meal security. It became clear that the food culture of a society interacts with a number of natural and socio-cultural factors. These factors are part of a web of interdependent procedures with various influences and impacts which have to be understood as dynamic and accommodative processes due to change, exchange, and communication. Looking at only one single aspect would exclude influences, causes, and explanations which are essential to understand social and cultural behaviour and characteristics. The case of the food habits in El Obeid showed how natural, economic, political, social, normative, and psychological factors interdependent and interact with the food habits and therefore with meal security. Even though the influences have different weightings on the different procedures of the food habits, vary from one social group to another, and might even between individuals none of them should be seen isolated from the others. It became clear that meal security cannot only be examined from a separated scientific, economic, or political point of view but requires a cultural ecological perspective to recognise and understand the core of problem.

The finding of this research can, according to the concept of the cycle of meal, be summarised as followed:

Nature

The natural environment is the fundament for the food supply. Climate and geography of a region determine what kind of plants and animals grow and how they grow in and adapt to

their habitat. According to natural conditions and available resources people arrange their food supply systems and to some extent processing and preparation processes. Therefore, nature determines the products which will be consumed. The natural environment of North Kordofan is characterised by semi-arid climate. The goz soil (sandy soil) with a low mineral and nutritional content, deficiency of organic matter, and low capacity of water holding as well as erratic rains are limiting factors for the regional food production which is mainly practised in the traditional rainfed sector. The staple crops millet and sorghum grown in North Kordofan are suitable for the dry and hot climate and are the basis for of the regional diet. Moreover, certain preparation methods such as fermentation or sun-drying have developed due to ecological factors.

The degree of natural influences on the food culture of a society depends on the way of life hence, the integration of society into nature and the integration of nature into the way of life. The influence of the natural environment on the urban food habits in El Obeid is far less than on its rural neighbourhood. Urban people depend on the market supply, which is influenced by seasonal and regional production but due to infrastructural development and a supra-regional supply the food supply in El Obeid is relatively stable and natural influences are much less relevant.

Conversely, urban food habits have an impact on the natural environment. Apart from an increasing non-agricultural population that has to be supplied urban dwellers increasingly demand certain products such as meat, edible oil, vegetables, and fruit. To satisfy the urban and market demands the agricultural production is intensified and increasingly focuses on cash crops. Over-usage of farmland, monocultural production systems, over-grazing of pasture, and deforestation lead to serious environmental damages such as degradation and desertification especially in the already vulnerable environments of many regions in Sudan. This again can have consequential effects on agricultural outputs, rural production systems, the economic activities, and social organisation of the rural communities, and the health situation of human beings.

Moreover, urbanisation affects the natural environment as energy sources (fuel, electricity, petrol) are required by the inhabitants or service and industrial sectors serving the needs of the urban dwellers which produce waste, sewage, and waste gases. These kinds of wastes have to be dealt with in a way which does not harm the environment and the health of the population. Nevertheless, there is no reliable waste and pollution management in El Obeid which already leads to serious environmental pollution and will increase on an even more alarming rate with a growing urban population. As the expansion of the town is uncontrolled and unorganised the growing urban development area will also destroy the existing natural system.

There is no doubt that nourishment is the closest connection of human being to nature and that it is essential to satisfy the metabolic demand of the human body. However, the case of El Obeid showed that this matter is hardly a conscious determinant for most eaters and meal suppliers. Even though people might be aware of a healthy and balanced diet first of all the food and dishes eaten have to fit into their cultural and social system and understanding.

Technology

To utilise nature human beings make use of technologies according to their natural environment and cultural development. Especially for nutrition and securing the livelihood technologies are essential. Just living on raw products found in nature could not guarantee a sufficient diet. Apart from domestication and agricultural production technologies are important for transportation, food storage, processing, and preparation to guarantee the food supply and make food products digestible and eatable (in a physiological and cultural sense).

Especially in harsh environments with seasonal fluctuation, like in many regions in Sudan, people develop technologies and methods to deal with the environment and to secure their livelihood. This includes methods and technologies to guarantee food supply, to increase the shelf life of products, to overcome shortage, and to improve the quality of the fibre-rich diet or make certain products eatable at all. In the urban area of El Obeid these technologies are of less importance as the direct influence of the natural environment concerning the food habits is small. Even if the urban food supply depends on technological abilities of the agricultural production it also includes technologies that, independently from the natural environment, produce industrial food or transfer supra-regional products to the urban markets to satisfy urban demands. The increasing separation through and of technologies from the natural environment also applies for the urban food storage and preparation. The case of El Obeid made clear that storage technologies determine the market supply as well as the household's food habits. While traditional preservation technologies such as fermentation and sun-drying are more and more disappearing, modern technologies like deep-freezing and refrigerating are most common (which cannot only be explained by the hot climate). Wood and charcoal fire are replaced by gas and electric stoves. And labour-saving tools and pre-processed or processed products are increasingly used to ease and rationalise the process of food preparation and make it more convenient - all that with clear effects for the urban food culture. Obviously, the technologies used in urban food culture interact with the urban way of life, its daily activities, and the attitudes of urban dwellers while direct natural influences are of no significance anymore. In urban centres life is technologised not to deal with nature but with rationalism, economic efficiency, standardisation, and convenience.

It can be generalised as a worldwide trend, recognised in urban Sudan in a similar way, that modern technologies reduce the human relationship to nature. Firstly, through modern technologies more food is produced by less people. Especially urbanites, increasingly detached from nature, do not get in touch with food production. The food products become economic commodities and are not natural products anymore which take a lot of effort to grow and harvest. This estrangement from nature is a typical phenomenon in urban and industrial societies and often part of the careless dealing with nature as people no longer understand nature as a material basis for human life. Secondly, through modern technologies, especially in the industrial sector the efforts of preparing food on household level are reduced as natural products are replaced by artificial ingredients and so the connection to nature gets lost. For example, industrial food requires only little or no preparation and diminishes the procedure of transforming a natural product into a cultural. Especially in urban lifestyle more and more women make use

of modern technologies as food preparation is seen as a nuisance and time-consuming activity. This leads to a change of attitude towards nature and to cultural values. Reduced preparation time and effort through industrial products decreases not only the contact with the natural product but also changes the relationship to it. Not realising the effort it takes to create a meal from a self-produced product reduces the respect towards and the value of the outcome while through the preparation process a relationship is established towards the product. For example, a meal prepared from a raw or even self-grown product including all different kinds preparation activities tastes totally different, has a different meaning, is dealt with more carefully, is eaten much more conscious, and much more valued by the consumer than a convenient dish with artificial flavours coming out of the microwave.

Infrastructure as an important technological development not only determines the market supply and the mobility of commodities, people, services, and information. The weak infrastructure in El Obeid in form of poor sanitary conditions and the insufficient supply with clean drinking water represent serious threats for the meal security and health situation in town which affects a majority of the urban population and especially poor household.

Economy

Food habits are determined by several economic influences. Apart from the macro-economic situation and performance the food habits in non-agricultural and urban households, as in the case of El Obeid, mainly depend on the income, market supply, prices, infrastructural development, availability of and access to resources, economic activities, job opportunities, mobility as well as the material and monetary assets of the household.

The market supply in El Obeid provides a wide range of regional, national, and international food and food-related products. In spite of the remoteness of El Obeid and weak infrastructure in Kordofan prices for food and non-food products are not higher compared to the Nile Valley. At least in times of sufficiency prices for staples and other kinds of food as well as semi-luxury products were identical to Khartoum. Nevertheless, several previous studies have shown that urban, especially cereal markets are quite responsive to production changes and price fluctuations with serious consequences for consumers procuring food through an income.

The variety and amount of supply decrease with growing distance to the town centre due to the infrastructural settings and the purchasing power of the residents. Prices and income determine what kind and how much food is available for the consumers, and where it can be bought. The income opportunities are limited in El Obeid and a large part of the citizens secures their livelihood with low-income jobs. Especially the lower-income groups are endangered by meal insecurity as their diet is often qualitatively and quantitatively insufficient. The diet of low-income households mainly consists of simple, often monotonous traditional fibre-rich dishes or typically cheap urban food products. With an increasing income the food patterns usually change to a more diverse and energy-rich diet. The case of El Obeid demonstrated that an increasing income leads to an increased consumption of urban dishes high in fat, protein, sugar, and containing less fibre as well as the number of daily meals increases.

Moreover, the economic activities of the population in El Obeid influence the food habits. People tend to rationalise their food habits by consuming more and more pre-processed and industrial food or even eat out. This mainly occurs when the mothers and daughters pursue daily activities outside the house. Many urbanites prefer food that suits their daily routine and the urban lifestyle which is often connected to a change of status, image, and worldview. On one hand this increasingly detaches people from the cultural process of creating a meal and on the other hand disperses the eating groups. This does not only mean the loss of culture but also of identity as well as emotional and social bonds.

The food habits in El Obeid also affect the food production and markets. The urban demand influences the market supply and therefore the food production and trade. For example, the demand for meat, vegetables, fruit, and wheat products creates new opportunities for producers and traders. Especially for small farmers depending on their subsistence food production focusing on urban markets and cash crops can endanger the livelihood and meal security. Moreover, the increasing demand for wheat products such as bread and pasta challenges the national budget and trade balance as huge amounts of wheat have to be imported.

Politics

Governmental policies and decision making have a strong influence on the nourishment and food supply of societies. The control over the food supply of societies is an important political instrument. For centuries governments have released policies to regulate, protect, and control the supply, demand, and trade of food.

The political system of the Sudan can be characterised by instability, governmental controls, interventions, lobbyism, self-interest, favouring of the elite and urban population, and warfare. Even though the natural conditions and technological and economic factors interact with the food system in Sudan, political decision have a major impact on the food situation and therefore the food habits and meal security of the whole country.

For many decades agricultural policy programmes have neglected the traditional rainfed subsector where the bulk of food is produced. Meanwhile, agricultural programmes continued the colonial policies of supporting export-oriented and commercial production of the irrigated and large-scale mechanised subsectors meaning a source of revenue. These politics, including the expansion of the commercial land, cause the supersession of traditional farmers and pastoralists from their traditional land as well as they lead to an insufficient supply of and access to inputs, service, and credit. This and worsening, economic, social, and ecological conditions undermine the traditional agriculture and endanger the livelihood of the rural population.

Additionally the food system is weakened by unstable outputs of the food producing sectors which lead to strong annual price and production fluctuations. These can hardly be buffered by the insufficient stock building of the authorities. Even though many parts of agricultural production and marketing are controlled, the attempts of interventional buys of grain to stabilise the price and supply are done half-heartedly.

The decision making of the Sudanese government also has a major impact on urban food systems. It has always been a political interest to satisfy the demands and needs of the urban

population as towns usually accommodate the political elites and local governments. This attitude remained from the colonial system which skimmed off agriculture products to satisfy the urban population and elite. The political interest to satisfy the urban demands and to guarantee a diverse and plentiful market supply with stable prices reflects best in the pro-wheat-policies of several Sudanese governments. Wheat is a strategic crop in Sudan. It is the aim of the government to change the Sudanese elite and urban population from sorghum-eaters to wheat-eaters. The promotion of wheat consumption, production, and import cannot be explained by any plausible socio-economic or socio-cultural reasons. It did not focus on an improvement of the food situation but was an ideological matter: eating bread is modern and progressive, while eating sorghum is out-of-date and backward. The idea of changing the urban population into modern, progressive wheat-eaters is based on a contorted social and political view with serious negative effects on the natural, economic, social, and cultural environment. To cover the increasing demand for bread immense economic, technological, and financial efforts are required.

The case of El Obeid demonstrated that the urban privileges of a diverse and stable market supply do not reach everybody by far. As food and food related items have to be bought many, especially low-income households, do not benefit from urban privileges. Insufficient job opportunities, poor infrastructure, sanitary facilities, and health service are serious problems and do not improve the situation of the urban poor. In El Obeid no political efforts to improve the income opportunities and the living standard of the urban poor are made. It became obvious that urban privileges concentrate on the town centre and areas where authorities and the elite settle and can only be afforded by higher income groups. Apart from granting privileges to the town centre and the neglect of the outer parts, food (e.g. bread) which is not consumed by the urban poor but by better-off households was for a long time subsidised. Therefore, the political instrument, which should protect the consumer, reaches mainly households with higher incomes and no food shortage. Zakat is the only existing governmental social support for underprivileged and can only give insufficient support to households in need. It seems that there is no political willingness to improve the living situation by improving housing, infrastructure, sanitary facilities, health and education services, job opportunities, and the access to food and food-related items. This not only leads to serious gaps in the living standards between the urban strata but to serious threats for the meal security of the urban poor.

The problem of urban impoverishment even increases due to the rural neglect. In North Kordofan the worsening environmental, economic, and social conditions force more and more people to migrate to urban centres such as El Obeid in hope for better living conditions and income generation. Due to the weak urban development and socio-economic structures in town the situation of the migrants mostly worsens.

Moreover, the violent conflicts in Sudan that have been happening in several parts of the country more than 50 years have a serious impact on meal security. Apart from being life-threatening they lead to the destruction of social structures, economic and agricultural production systems, food trade, and infrastructures. People are driven out of their habitat and social communities. Their land, assets, and communities are destroyed. In the conflict areas infra-

structure cannot develop which often leads to the cut-off or total desertion of whole areas. The violent conflicts also have serious consequences for the whole country. Not directly affected regions have to deal with landless and assetless refugees, disrupted economic development due to immense budgets and time wasted for military issues, international sanctions, and the loss of a workforce of young men.

Over the last 50 years none of the different Sudanese governments have made serious and successful efforts to fight these problems. The present agricultural policies still follow the targets to improve the agricultural exports, to reach self-sufficiency in import products, and no attention is paid to the rural and urban poor. Even though there has been a slight improvement in the economic situation over the last few years, the agriculture and economy of Sudan are still fragile and characterised by governmental control and intervention which hardly follows the producers' and consumers' interests. Moreover, there are still serious food gaps in many regions with high rates of chronic malnutrition. As there is no political willingness to close at least the food gaps in some regions it cannot be expected that there is a political awareness of securing the livelihood and aiming for meal security of the population.

Social Organisation

Social structures interact with the food patterns as they reflect socio-cultural characteristics such as status, hierarchy, identity, friendship, communication, and traditions. From examining the social organisation of societies it became clear that food is more than nutrition and closely connected to socio-cultural factors. For the human as cultural being it is not only important what is eaten but how, why, and in the presence of whom as the consumption of meals expresses specific social characteristics.

The food habits are important indicators for social status and class. Certain food is considered as cliché and distinguishes between social classes or creates identity and belonging. Some types of food confer high status onto the eater and others are associated with high status because of the group who usually eats them. In El Obeid the kind of dish, the number of dishes per meal, and the numbers of meals per day are important status symbols. The 'typical' urban dishes, which are synonyms for status and prestige, contain a lot of meat, oil, and vegetables, like tabikh which contains a variety of expensive ingredients. Eating tabikh demonstrates urban status while not eating tabikh on a daily basis is considered as poor. Therefore, even low-income households in El Obeid aspire to eat tabikh occasionally to prove to themselves and to others their urban status. As a daily 'must' tabikh also has to be combined with a number of other dishes served for a meal. The urban norm suggests five to seven different dishes for a main meal. Tabikh is the main dish and the others should be urban dishes containing meat, vegetables, and oil. The consumption of urban dishes is closely connected to bread and its urban status. Urban dishes have to be eaten with bread because aceda and kisra are not suitable. Additionally the bright colour of bread distinguishes it from the greyish rural products like aceda and mulah.

As in many culture the household's status in El Obeid is judge by the meals served. Especially in the presence of visitors households are eager to give a good impression. Even low-income households try to serve guests with tabikh and some additional urban dishes. The food

served is not only an important means of representation and an indicator of status; it also reflects the skills of the cook and the host's respect for the guest. Therefore, a host is supposed to present his guest with the best and largest amounts of food he can afford.

The sharing of food is another important social institution in Sudan no matter whether in rural or urban areas and whether guests are present or not. The shared meal, sharing dishes from one bowl is identity creating, a symbol of consideration, confirmation of social community and mutual responsibility and appreciation, and an important means of communication. As the social networks in towns like El Obeid are looser than in rural communities the act of sharing a meal is a central element of maintaining and strengthening social relationships. While in some cultures guests are not included into family meals in Sudan guest are always generously invited to share meals. With guests, however, it is very likely that the eating group will be separated by gender. While both groups are served at the same time with the same food, the tray for the males might contain some extra food (meat) or bigger servings. As food is eaten from a round tray the seating arrangement symbolises unity and does not reflect the hierarchy within the eating group. This will be expressed by the distribution of the food. Big and nicer pieces of meat will be placed near the head of the family or the honoured guest.

Gender relations also affect the procedures of the food habits. Even though the food-related activities and spaces of men and women vary depending on ethnic, class, age, location, and personal attitude, the gender relations show clear structures concerning the food habits. Traditionally, the male head of the household is responsible for providing the foodstuff through production or purchase. The woman is the gatekeeper of the food and controls the flow of food into the household. She is responsible for preparing and serving the food. Especially in poor urban households women also supply money to sustain the household's livelihood and meal security. With this change of the activity profile women do not spend most of the day with food preparing and housekeeping activities anymore. Even though the income generation is a meal securing activity, with the shift of activities at home to activities outside home the transfer of knowledge and skills from mothers to daughters about meal preparation and nourishment, which is an essential part of the culture and meal security may be disrupted.

Interestingly, through urbanisation the food habits of people even with different ethnic and cultural backgrounds get standardised. There are not so many ethnic distinctions in the food habits but more generational characteristics of the food habits in El Obeid. The attitude towards food pattern and cultural norms become standardised with younger generations. While older generations prefer traditional food and consumption patterns younger generations show a clear trend towards western-style and imported food and food habits. This not only applies to the products consumed but also to the way of supplying, preparing, and eating the food. The use of industrial products and modern cooking facilities, the rapid increase in the consumption of meat, wheat, fast food, street food, and convenience food, and the desertion from the common eating group, all this reflects the transformation of the society from close, communal, and familiar units into a system of separated individuals or nuclear groups. This not only means a loss of cultural heritage but under the aspect of increasing urban poverty and a non-stabilising food system also the loss of traditional social structures.

Norms and Religion

There is no society where people are allowed to eat everything, everywhere, and with everyone. The ideology and believes of a society are fundamental for the behaviour of its members. Each society or group has rules, norms, and laws which enforce and determine social behaviour and therefore guarantee the existence of the society.

In an Islamic society such as Sudan there are certain religious rules which interact with the food culture. While in many western cultures religious influences on food patterns have almost vanished, the power of religious believes is still very strong in Sudan. The religious influences exist in form of several taboos, restrictions, and rules and express mainly what kind of food is clean to eat, how it has to be prepared, or how food has to be eaten. The religious influence is most obvious concerning the consumption of meat. The slaughtering of an animal is connected to several religious rules which have to be strictly followed. Even if the citizens of El Obeid buy pieces of meat for daily consumption it has to be slaughtered the correct way.

Food for special occasions is also bound to several religious rules. Most of the special occasions are religious holidays with clear rules and norms for the food which is served. Special occasions are often the return to traditional food and rituals to honour Allah, the Prophet, and the community.

Some kinds of food are traditionally known for having magical effects on the consumer. Nevertheless, the importance of magic has almost disappeared from the urban food culture in El Obeid. As magical believes are bound to traditional knowledge about the effects of certain food and ingredients, the loss of magical values also means a loss of local knowledge and cultural heritage.

There are also some social norms and rules that prohibit traditional food patterns. For example, the radical Islamisation of the society, which is much more a political than a religious issue, prohibits the consumption of alcoholic drinks and therefore that of the traditional millet beer marissa. Apart from being an important nutritional food stuff marissa used to be very important as a social mean expressing hospitality, care, sense of community, solidarity, community aid, and social and cultural identity. Hence, its prohibition is not only the loss of a traditional food; it also destructs social structures and networks.

Psychology and Individual Preferences

Food selection and individual preferences are based on how people think and feel. People do not eat for nutritional satisfaction. Choosing what, how, where, and with whom to eat is a complex process influenced by many mental considerations. People do not only eat with their stomachs and taste buds but also with their eyes, minds, and emotions.

The observed households in El Obeid showed the importance of the individual attitude for the consumption patterns very clearly. Their food choice, preferences, and actual behaviour demonstrated the complexity of food habits. Individual preferences do not only determine the eaten food but also the procurement, preparation, and consumption behaviour with a different individual meaning for everybody. For example, some people preferred to buy their food from a specific market because of a reasonable price. Other preferred a different place because of

its quality. Some women cooked in the traditional way with wood or charcoal while others preferred the gas stove. Some family preferred shared meals on a daily basis; other ate individually during the week. Factors like taste, texture, appearance, or aesthetics are the most obvious influences for food preferences. However, depending on the individual attitude, convenience, purchasing power, daily routine, skills, or convictions may be some others of the numerous factors influencing food preferences.

Even if every person judges and categorises food and food habits differently and does so under different aspects individual preferences do not guarantee freedom of choice. As food patterns are culturally bound people cannot exclusively follow and satisfy their individual preferences. Food is culturally classified in what is eatable and what not. Socio-cultural characteristics determine how food has to be prepared and eaten, and economic and social factors determined the choice of food. The households in El Obeid showed that some people ate the food they preferred and could afford – according to social standards or just for their individual desire. Others ate food they do not prefer but can afford - according to their income or to fulfil social standards. This makes it obvious that it is impossible to generalise the impact of individual preferences on the food habits.

Nevertheless, the food preferences in El Obeid showed some clear trends. One was the preference of eating meat on a regular basis. This is not due to nutritional considerations or metabolic needs but because of status. Whether this preference can be fulfilled is determined by the economic situation of the household. Many of the households cannot afford meat on a regular basis and therefore have to choose alternative food according to their purchasing power. This is similar for bread. Even though bread is quite affordable it symbolises urban status because it is eaten with urban products. The preference for bread can therefore be understood as a preference for urban food patterns. While some compare bread with urban standards others compare bread with a modern lifestyle, attitude, and transformation of society. Especially younger generations prefer bread as it stands for a modern and western way of life. Sandwiches are associated with a new worldview and new social structures. They are preferred by many because they symbolise freedom, flexibility, and individuality for the way of eating, the way of life and the mind.

14.2 Conclusions for Human and Cultural Ecology

Based on the ideas of human and cultural ecology the concept of the cycle of meal was developed to analyse the food habits of a society. The food habits were examined by considering them as interactive with their natural and socio-cultural environment. Even though the human and cultural ecological approaches do not specifically deal with the food culture, they are closely connected with it. Food describes the relationships and interactions of humans, nature, and society. The food patterns of a society are embedded in the dynamics of the natural and the cultural system and can be described as a result of the interactions between the humans and their natural and cultural environment. Therefore, the human and cultural ecological approaches support the examination of the socio-cultural complex of the cycle of meal.

Food habits have to be seen in their natural and socio-cultural context and are an expression of the relationship with nature as well as of social structures, norms, and values. The examination of food culture has shown that food habits and meal security are culturally bound and has proved the importance of considering the interaction of natural and socio-cultural elements. The food habits are also an outcome of the ability of the individual to interact with these elements and reflect the consequences of that behaviour for the whole system. This not only applies to food culture but all kinds of social and cultural questions. Especially in the current situation of increasing distance between human societies and their natural environment, destruction of the natural fundament as well as ongoing decline of social structures and economic inequality human and cultural ecological approaches are of great relevance in numerous social, cultural, and scientific fields. The analysis and understanding of interactions between human, society, and nature is necessary to overcome the dichotomy of the existing socio-cultural paradigms. However, the application of these ideas requires an extension and updating of existing approaches as well as a specific reflection on each research.

With the analysis of food habits natural and cultural elements of the system had to be defined. Nature, economy, politics, and norms, according to Park's human ecology, were extended by the elements technology, social organisation, and psychology relevant to the topic. The elements are of different weight for the system and are not universally applicable for every culture. Nonetheless, the description and detailed examination of the different elements underlined the necessity of a holistic and interdisciplinary view. However, an interdisciplinary approach alone cannot be sufficient. The interactions and interdependences of the different elements and the relationship between society and environment are the core of the examination. Hence, the web of natural and socio-cultural interaction and influences with the human being as active part of nature and culture has to be the focus of attention. As every kind of behaviour and action affects the whole system special attention has to be paid to the actors. Apart from being a natural, economic, or political being first of all the human is a social being. Therefore, social organisation and behaviour are highly important for individual and social actions and should be a central element of human and cultural ecological approaches. Even though the normative system sets rules and norms applying to society members the social organisation is closely interlinked with it. Hierarchies, power structures, gender, age, strata, and ethnic have to be considered for the understanding of behaviour and actions. The organisation of a society in combination with the other cultural elements has a strong impact on the relationship between society and environment - which is the core question of cultural ecology.

This also applies to psychological elements. Norms, rules, and traditions shape, modify, and restrict human behaviour and action. But how do the members of a society react to the normative system and what is their perception of it? Every person describes the society and environment from the perspective of his own experiences, emotions, and interests and claims it to be the reality. Even though certain behaviour, actions, perceptions, and with it positive and negative experiences, are the outcomes of the social and cultural learning, the dealing with the normative system is determined by individual/ psychological characteristics of the society members. The experiences and emotions from it are essential for further actions, behaviour,

and perception and therefore the development of society and culture and dealing with the natural and socio-cultural environment.

Food habits, as other cultural characteristics, are often specific to a certain region and even vary within a society (cf. Steward 1955). Locality therefore has to be considered in human and cultural ecological approaches. Cultural contexts can hardly be generalised as they are special to every culture with a differing weight of the natural and cultural influences and interactions. In other words, the approaches of human and cultural ecology have to be applied and adjusted to the given setting considering its dynamics. However, this does not mean a neglect of the national and global level. Local systems are not isolated and autarkic. Especially problems like food shortage, impoverishment, social decline, wars, and environmental pollution affect the whole global system and community.

14.3 Constraints of the Food System in Sudan and Perspectives for Meal Security

The problem of meal insecurity in Sudan has been discussed in detail and the rates of malnutrition and high vulnerability to hunger in many regions actually confirm the problem. Even though the country produces enough food products in good seasons and imports enough wheat, it does not guarantee meal security. Many reasons for food shortage base on decades of political and economic mismanagement. Granting the commercial and cash crop agriculture privileges instead of supporting the traditional rainfed agriculture as guarantor for regional self-sufficiency can be considered as a destruction of the food production. The failure to develop infrastructure in rural and marginal areas excludes major parts of the population from the national economy, from major commodity, financial, and labour markets, as well as from other natural, social, and economic resources. It also weakens the food and commodity distribution system. Governmental interference and control on all levels of food production and marketing destabilises the food system and demotivates producers, traders, and investors. The problem of meal insecurity is even worsened by the long-term violent conflicts inside Sudan. The behaviour of the government to provoke and deal with internal violent conflicts emphasises the political ignorance towards the instable food and price system, malnutrition, vulnerability to hunger and destitution, impoverishment, weak purchasing power, and economic and social decline.

The rapid growth of the urban population in Sudan presents also major challenges to the Sudanese food system. People are increasingly dependent on an instable cash-based food distribution network. On one hand this has consequences for the local and national food production as well as food imports. On the other hand the weak structural and economic development of towns, insufficient market and food system, limited job opportunities, low incomes and purchasing power pose the threat that the system might not meet the needs of everybody in a long run.

It has become clear that Sudan cannot achieve meal security with the present economic and political framework. There are several approaches suggesting a number of alternative strategies and reforms to improve food situation in Sudan but governmental institutions more or less ignore these. There is no doubt that a stable and socially fair macroeconomic system

would be an important basis for solving the problem of food shortage. The same applies to the ending of violent internal conflicts and a stable and sustainable political system. The promotion of sustainable traditional agriculture, the development of social and technical infrastructure, especially in remote areas, and an increasing provision of input, credit, and services for small-scale farmers could improve the economic situation of the rural population and even lead to regional self-sufficiency. The structural development of towns, the strengthening of the labour market, income stability, and the support of the informal sector are other important strategies on the way to meal security. The establishment of a sufficient buffer stock could lead to stabilised food supply and food prices. In addition, the reduction of production and trade barriers could strengthen the food system.

Even though all these are important strategies to fight food shortage they will hardly succeed as long as they concentrate on economic and political development only while ignoring the socio-cultural structures of the society. The cultural ecological analysis of food habits proved that food habits are culturally bound and meal security is not reached by simply providing a sufficient market supply, access to food, or a certain amount of calories for daily intake. Reducing meal security to the level of production, marketing, access, and nutritive supply does not solve local and household food shortage. The right amount and combination of food and nutrients might ensure nutritional security but not meal security. For most people in most cultures the consumption of food is a social and cultural event and a sum of different actions and procedures - including production, supply, preparation, serving, and consumption - that take place within a specific socio-cultural context. Food habits are more than a sufficient market supply, access to food and the satisfaction of metabolic needs; they are the satisfaction of sensuous and cultural desires. Food is not only a material matter. It is also a dynamic element of social organisation and immaterial culture. This fact has to be taken into account for future strategies.

Food habits are specific to a society and often vary even between regions or social groups. Moreover, regions are affected differently by the natural and cultural environment, location, and position within the country. To identify problems and opportunities of those affected special attention has to be paid to the local circumstances and culture and not only to the national overall situation. Meals take place within families or within eating communities. Hence, they have to be the centre of attention. Furthermore, changes, innovations, and strategies have to be considered in the context of the people's way of life. Any actions should not interfere with existing social and cultural systems, otherwise they could endanger or even destroy socio-cultural structures and the livelihood of those affected. Of course, an approach for meal security cannot consider the requirements, demands, and preferences of every single individual, but there should be a socio-economic and political framework which creates fair basic prerequisite allowing everybody the same opportunities and basic supply and a free choice what to do with it.

The concept of food and nourishment is a complex system embedded in a number of different natural and socio-cultural characteristics specific to each culture, society, and social group. The cultural ecological approach allows and demands for the examination of the whole socio-cultural complex of the cycle of meal. The food habits of the human being have to be seen in

their natural and socio-cultural context and are an expression of social structures and cultural norm and values as well as of the relationship to nature. Natural conditions, economy, politics, social organisation, norms, and preferences are important elements. It can be supposed that they have different priorities within different cultures. Nevertheless, it is unlikely that each of these elements independently influences the food habits. To fight food shortage successfully a cultural ecological approach with a holistic analysis is necessary. All attempts to solve the problem by isolated scientific, economic, or political approaches while continuously ignoring socio-cultural elements such as social organisation, norms, values, symbols, and preferences are insufficient and short sighted. It is the meal, a highly cultural element, which feeds the humans and for securing it socio-cultural interactions should not be ignored. Meal security must be understood as the function of different interdependent natural, economic, political, social, cultural, and ideological factors which are specific to each culture or even social groups. Therefore, to reach a sustainable meal security strategies and actions should include a cultural ecological approach.

14.4 Conclusion

Food habits are a central part of every culture and are a result of the interaction between different natural and cultural factors and the ability of the individual to interact with both these spheres. Using a cultural ecological approach this research analysed the complexity of food habits, their dynamics, and how the food culture of a society interacts with the natural and socio-cultural environment. The interacting factors are part of a web of interdependent procedures with various influences and impacts which have to be understood as dynamic and accommodative processes due to change, exchange, and communication. Examining only one single aspect would exclude influences, causes, and explanations which are essential to understand social and cultural behaviour and characteristics. As the research focused on a region which suffers from malnutrition it was also going to demonstrate the necessity of examining food culture as a central element for meal security. The case of El Obeid showed how natural, economic, political, social, normative, and psychological factors interdependent and interact with the food habits and therefore with meal security. According to this the research emphasised that meal security cannot be examined from a separated scientific, economic, or political view only but requires a cultural ecological perspective to fully recognise and understand the core of the problem.

Even though the research was focusing on one specific town, an examination of the overall situation of Sudan was included. As El Obeid and the region of North Kordofan are not autarkic macro-economic and macro-political factors proved to be important influences on the food system of the area. Sudan, as the largest country in Africa represents a unique variety of climates, plants, animals, tribes, and cultures. Many different natural and socio-cultural influences make it impossible to speak of typical Sudanese food patterns. It is much more the variety of different special features which characterise the food culture; a mixture of African and Arab influences. Nonetheless, political decision making and macro-economic actions have similar effects on the whole country.

Sudan could be self-sufficient with sorghum but there are severe food gaps and high rates of malnutrition. Although in many regions agricultural production is impacted by erratic rains and soils with low fertility the reasons for the food gaps cannot exclusively be blamed on the ecological conditions. Especially the economic and political frameworks impede the national food system. Governmental policies, poor macro-economic performance, lacking infrastructure, commercialisation of agriculture, rapid urbanisation, growth of the labour force, violent conflicts, and a generally instable and insufficient food system have a direct influence on the national food supply.

While the bulk of sorghum is produced in the mechanised subsector subsistence production in traditional farm systems is an important guarantor for local meal security. Agricultural policies favour the cash crop production in irrigation system and large-scale mechanised farming and ignore traditional small-scale and subsistence farming. Contrary governmental actions such as controls and interventions on production and marketing make the commercial sorghum production to an incalculable profit at the expense of the producers and consumers. The food system, especially of staple food, is characterised by production instability and annual price fluctuations. Especially the mechanised sorghum production is strongly influenced by the market situation. The production following the market price and not the demand creates regular deficits in the sorghum supply. As the government fails to create an appropriate sorghum stock the fluctuations cannot be buffered and unexpected crises can easily occur.

The poor infrastructure is another bottleneck for the national food supply. While the main production areas of commercial agriculture are fairly well developed, remote areas where malnutrition is most likely to occur are isolated. This not only endangers the food supply for the remote areas, it also limits the marketing and income opportunities for the affected population.

Moreover, the commercialisation of agriculture has a great impact on meal security. With the rapid expansion of the mechanised areas many rural households have been edged out of their traditional farmland and pasture and are thereby excluded from the national economy. This in combination with a weak rural development and a high vulnerability to the harsh ecological environment has severe impacts on the ecological and social system. On one hand many traditional farmers are forced to intensify their agricultural activities and extend their production area which leads to erosion and desertification. On the other hand many people have to find other income opportunities and often migrate to urban centres or agricultural schemes. However, this does not guarantee income stability and additionally affects social structures. Furthermore, increasing rural destitution destroys existing social networks which are important institutions to buffer crisis.

The rapid urbanisation and growth of non-agricultural population also challenges the national food supply. More people than ever have to be supplied through the market with an increasing demand for non-local products. With the cash-based food system people are moved from their role as food producers into the dependence on an instable food distribution network. The insufficient market and food system, strongly fluctuating prices, limited job opportunities, low

and instable incomes and low purchasing power pose the threat, that this system will not be able to meet the needs of everybody.

Another serious threat for the national meal security are the long lasting violent conflicts. They affect all levels of the society and the economy. Almost the whole south of the country with its high agricultural potential has not been included in the economy of the country at all for many decades. Now, the same applies for Darfur. The armed conflicts do not only bring with them heavy losses of human life but also destruction of agricultural output, infrastructure and markets, as well as extremely high budgetary expenses. The civil war also destroys natural resources, socio-cultural structures and networks, and drives people out of their farmland, homes, and cultures. Apart from the direct effects for the affected areas the civil war has a huge impact on the rest of the country. Many regions not directly involved have to deal with millions of refugees. In addition the direct cost for the war in the South was estimated at US$1 million per day. The indirect costs are the loss of development potential in the South and the failure of the economic development in the whole country. Furthermore, the war has claimed many lives causing tremendous loss of manpower for the national economy and the households.

The cultural ecological context of food habits, its dynamics, and its significance for meal security have been demonstrated with the case of the town El Obeid. El Obeid is situated in an area vulnerable to erratic rains, erosion, and pests. Crop failure and seasonal hunger have been well-known events in this region for centuries. The main food crops in Kordofan are local varieties of millet and sorghum both well adapted to the hot semi-arid climate and the geographical conditions. The cereals are the basis for many different food products. The most common traditional grain dishes are the thick porridge aceda and the paper-thin bread kisra. They are usually eaten with sauces containing ingredients such as vegetables, meat, herbs, dairy products, or wild food. the sauces are important to complete the dishes and to increase the nutritional value.

For the town itself the ecological influences are of less importance than for the rural areas. Nonetheless, the harsh conditions and the remoteness of the rural surroundings also reflect on El Obeid. Although the town has been an important trading place for many centuries and is connected to the national road system, the remoteness and the economic as well as political neglect of the region cannot be denied. The technological infrastructure is weak and mainly covers the centre part of the town. Job opportunities are limited and wages are low. The purchasing power of many citizens is weak and the mobility often limited. Even though the food supply of El Obeid is generally sufficient, offering a big variety of regional, national, and imported commodities the research has demonstrated that an adequate diet cannot be secured by a sufficient supply exclusively. The extensive food supply mainly concentrates on the central parts of the town and is by far not affordable for everybody. As the demand for food has to be covered through an income the sufficient food supply in town does not guarantee meal security for everyone.

Most of the food purchased on the markets in El Obeid is fresh, unprocessed, or semi-processed and has to be prepared to become an eatable meal. So even in the case of sufficient

food supply and access to the products meal security cannot be reached without the skills and the knowledge of meal preparation. The detailed examination of meal preparation processes underlines the fact that meal security is more than just a sufficient grain supply. Only with the preparation of a meal on household level it becomes clear what kind of food and ingredients are needed to create a meal. The outcome of the preparation mainly depends on the facilities, skills, and motivation of the cook as well as on the possibilities and preferences of the family. The preparation of most dishes is very complex and requires experiences, knowledge, as well as time and is culturally bound. There might be several possibilities which dish can be prepared from certain ingredients. However, the dish, which is prepared, is an outcome of the specific social and cultural background of the cook and the eating group. Even though several social and cultural changes could be observed in El Obeid, the role of the women as the gatekeeper of the families' foodways has not change. It is the mother's responsibility to transform food into the meal which will meet the desires and needs of the family. The exclusive responsibility of the mother for food preparation and food distribution within the household emphasises the importance of food preparation and the consideration of household structures for meal security.

The typical urban cuisine contains dishes which are mainly from the Turkish, Egyptian, and Arab cuisine. Bread, meat, vegetables, legumes, oil, and spices play an important role. The urban dishes are rich in energy and protein (meat, pulses, oil) and need a lot of ingredients and preparation time. Consuming the urban dishes bears a high status. The urban norms determine exactly what food and how many different dishes in which combination should be served for a meal. Following this standard expresses high status as well as affluence, progress, urbanity, and modern lifestyle as opposed to poverty, backwardness, rural lifestyle, or even incompetence of taking care of the welfare of the family. The necessity to fulfil the urban standards of food consumption applies to everyone, independent from the cultural or ethnical background. This is clearly a standardisation of cultural and social behaviour and a loss of cultural and local diversity. The ingredients and preparation process of the urban dishes are also quite expensive and can only be afforded by those with higher income. Low-income households mainly stick to traditional rural dishes or very simple and cheap urban food like bread with tomatoes or groundnut butter. As poverty is a widespread problem in El Obeid this makes urban food habits into a mean of strata division which indicates exclusion and social demarcation.

Like the meal preparation, the consumption of the meal is a cultural event. In El Obeid it is common that the meal is consumed traditionally by sitting together around the siniya, and sharing the food, eating it with the right hand. This social act of unity and sharing moves people closer together and creates an atmosphere of identity, courtesy, consideration, and respect. It is therefore an important element of social life.

The food habits in El Obeid show clear urban features. While millet and sorghum are of decreasing importance wheat has been becoming the main staple. This change is closely connected to a change in the choice of dishes. Traditional fibre-rich dishes are replaced by bread accompanied by energy-, and protein-rich dishes containing meat, vegetables, and oil.

The change of the food habits closely interacts with the change of social structures, culture, and norms. This has several reasons. One is the increasing determination of food and consumption patterns through urban lifestyle and daily activities. Meals have to fit into the daily schedule which is dominated by activities outside the homes. Time-saving food products are gaining importance for the urban food culture. Traditional dishes like aceda and kisra have to be prepared, require a sauce, the possibilities for side dishes are limited, and they bind the eater to the common eating group. Urban dishes have to be prepared too, but bread as the staple can be eaten with any kind of food – homemade or industrially processed. Moreover, the bread is bought ready to eat and if consumed as a sandwich the eater is not even bound to an eating group. Therefore, bread is seen by many as a symbol of modernity, flexibility, freedom, and urban lifestyle.

The increasing consumption of food on an individual basis or outside home disrupts the social institution of the traditional eating group. This is a significant change of social structures and communities caused by the urban lifestyle. The replacement of the common eating group by the individual and lonely eater can also be seen as a loss of the ability to deal with the natural and social environment in a responsible and satisfactory way. While many families in El Obeid try to stick to at least one shared meal a day, many households already practice it on holidays and special occasions only. This weakens social bonds which can bear high risks especially in times of social or personal crises. Moreover, the disappearance of the shared meal means a loss of rituals, symbols, communication, social community, values, and cultural identity.

The social bond and transfer of norm, values, and especially knowledge is already interfered in the process of meal preparation. Traditionally daughter used to assist the mother cooking and that way a transfer of skills and knowledge took place. However, in urban regions, like El Obeid, many working women spend less time at home which restricts their time for meal preparation or their daughters might not be able to join them in the meal preparation process. In that case the urban lifestyle also has serious effects on the cultural heritage.

The case of El Obeid has shown that a variety of different natural, economic, political, social, normative, and psychological factors interact with the food habits of the society. These factors are part of a system of interdependent procedures which have to be understood as dynamic and accommodative processes. Hence, not only the factors themselves have to be taken into account but also their interactive and interdependent relationships. It also became clear that the problem of meal security cannot be solved on the level of food production, supply, and marketing only. People do not consume a raw product but a culturally bound meal. Therefore, special attention has to be paid to food preparation and consumption and their interdependence with the socio-cultural system. For a solution to the problem of food shortage the concept of food and nutrition has to be understood as a complex and interdependent system which is not only based on material, economic, and political factors but also interacts with a number of socio-cultural meanings, symbols, and norms specific to each culture and society. Ever increasing poverty, malnutrition, social injustice, and decades of fruitless and half-hearted attempts to tackle the problem have shown that the problem of meal security cannot be solved from a separated scientific, economic, or political point of view. To guarantee eve-

ryone their essential human right to food respectively meals, science, and politics should start to recognise and understand the problem of meal insecurity from the perspective of those affected within their natural and socio-cultural framework and to approach the problem from a cultural ecological point of view.

Appendix

Appendix 1 Examples of Dietary Laws and Events of Different Religions

Food restrictions	
Judaism	Eat only meat and milk of animals with cloven hooves and which chew the cud, i.e. cattle, sheep, goats, deer
	Eat only birds and their eggs that have a crop, gizzard and extra talon, i.e. chicken, turkey, ducks, geese
	Eat only fish with scales and fins
	No eating of insects, birds of prey
	No eating of by-products of prohibited animals
	No eating of blood
	No eating of internal organ fat
	No eating of carrion
	Sciatic nerve may not be eaten, hence, often only forequarters of animal is eaten
	No mixing of meat and dairy products (Eating meat six hours have to pass before eating dairy products. Eating dairy products one hours has to pass before eating meat)
	No consumption of products that contain non-kosher ingredients
Islam	No eating of pork
	No eating of blood or blood products
	No eating of carrion
	No eating of food offered to other idols
	No eating of carnivorous animals and birds that seize their prey with talons
	No eating of land animals without ears
	Eat only fish with scales and fins
	No eating of by-products of prohibited animals
	No drinking/ eating of intoxicating beverages or drugs
Hinduism	No eating of cows
	Avoidance of killing or eating any animals (meat consumption is allowed but should be ceased)
	Not prohibited but abstinence of meat and wine bears great satisfaction, salvation, and purity for mind and soul
	Avoidance of food of other castes, many restrictions vary among the castes
	Avoidance of food prepared by certain groups (e.g. artists, carpenters, doctors, eunuchs, prostitutes, liars, thieves)
	Avoidance of food contaminated by a polluting substances
Buddhism	Avoidance of meat (Buddhist doctrine forbids the taking of life)
	No solid food should be eating the afternoon and evening (mainly applying for monks)
	Avoidance of garlic, scallion, leek, chives, and onions
Fasts	
Roman Catholicism	40-day Great Lent fast before Easter (food allowed but no meat)
	No eating of meat on Fridays
Islam	Month of Ramadan (no food and drinks from dawn until sun set)
	On Monday, Thursday, and the 13^{th}, 14^{th}, 15^{th} of each month (strict adherents)
	Encouraged to fast 6 days during Shawwal, 10^{th} day of Muhurram, 9^{th} day of Zul Hijjah

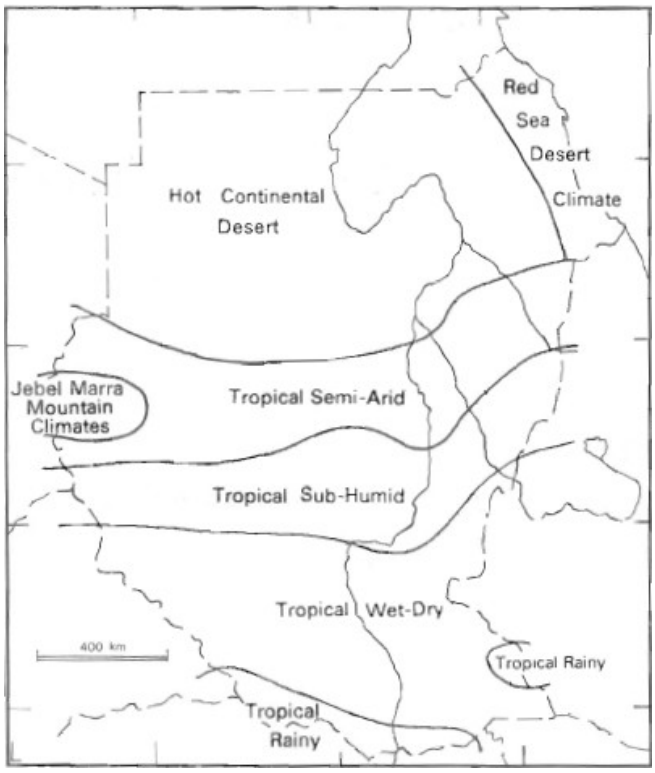
Fasts	
Judaism	Yom Kippur
	Pesach
	Tish B'av
	Tzom Gedaliah
	10th of Tevet
	17th of Tammuz
	Several family events (e.g. deaths)
Hinduism	Fasting practices according to caste, family, age, sex, and degree of orthodoxy
	1st day of the new and full moon of each lunar month; the 10th and 11th days of each month; the feast of Sivaratri; the 9th day of the lunar month Cheitra; the 8th day of Sravana, days of eclipses, equinoxes, solstices, and conjunction of planets; and Sundays
	The anniversary of the death of one's father or mother
	Several family, cast, religious events
Preparation of food	
Judaism	Ritual slaughtering (shebitab) of animals (including examination for internal irregularities which might make it unfit to eat) otherwise unfit to eat
	Organ fat, blood, blood vessels, sciatic nerve have to be removed from meat
	Separate utensils, pots, dishes for preparing and eating meat and dairy products
	No food preparation on Sabbath
Islam	Ritual slaughtering of animals (similar to Jewish law)
Table Manners	
Roman Catholicism	Short prayer before eating
Islam	Do not eat more than two-thirds of the stomach capacity
	Wash hands and mouth before and after eating
	Eating with the right hand (left hand is considered unclean)
Judaism	Cleaning hands and mouth after eating milk before eating meat
Hinduism	Ritual bathing and donning of clean clothes by Brahmins before eating
	Sanctifying of meat and fish the repetition of mantras offering it to the gods before eating it
(Symbolic) Sacrifices/ rituals/ special occasions	
Roman Catholicism	Communion (Eucharist)
	Harvest festival
	Paschal Lamb
Islam	Id al-fitr (no fasting allowed)
	Id al-adha (no fasting allowed)
	Shab I-Barat
	Nau-Roz
	Mauluid n'Nabi
	Feasting also at birth, marriage, bismillah, circumcision of boys, harvest, death
Judaism	Pesach
	Rosh Hashanah
	Sukkot
	Purim
	Shavuot
	Bar-Mizwa, Bat-Mizwa
	Feasting at birth, marriage
Hinduism	Several festival days offering food to a deity often including the use of ghee as a sacred product
	18 major festivals every year (e.g. Holi)
	Feasting at birth, marriage, death

Appendix 2 The Third Book of Moses; Leviticus 11, 1-47 (The Holy Bible)

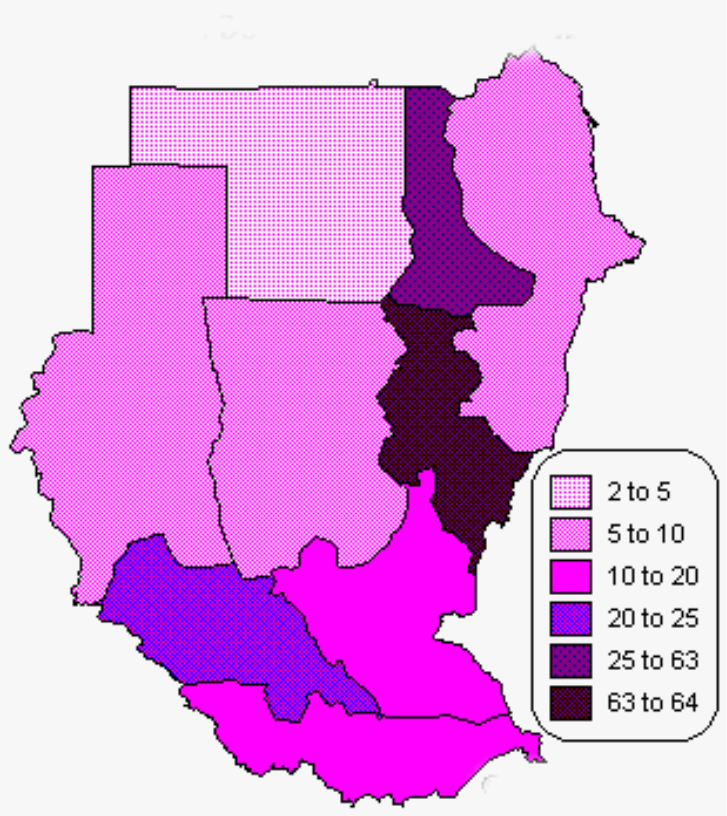
11, 1 And the LORD spake unto Moses and to Aaron, saying unto them, 2 Speak unto the children of Israel, saying, These are the beasts which ye shall eat among all the beasts that are on the earth. 3 Whatsoever parteth the hoof, and is clovenfooted, and cheweth the cud, among the beasts, that shall ye eat. 4 Nevertheless these shall ye not eat of them that chew the cud, or of them that divide the hoof: as the camel, because he cheweth the cud, but divideth not the hoof; he is unclean unto you. 5 And the coney, because he cheweth the cud, but divideth not the hoof; he is unclean unto you. 6 And the hare, because he cheweth the cud, but divideth not the hoof; he is unclean unto you. 7 And the swine, though he divide the hoof, and be clovenfooted, yet he cheweth not the cud; he is unclean to you. 8 Of their flesh shall ye not eat, and their carcase shall ye not touch; they are unclean to you.
9 These shall ye eat of all that are in the waters: whatsoever hath fins and scales in the waters, in the seas, and in the rivers, them shall ye eat. 10 And all that have not fins and scales in the seas, and in the rivers, of all that move in the waters, and of any living thing which is in the waters, they shall be an abomination unto you: 11 They shall be even an abomination unto you; ye shall not eat of their flesh, but ye shall have their carcases in abomination.
12 Whatsoever hath no fins nor scales in the waters, that shall be an abomination unto you.
13 And these are they which ye shall have in abomination among the fowls; they shall not be eaten, they are an abomination: the eagle, and the ossifrage, and the ospray, 14 And the vulture, and the kite after his kind; 15 Every raven after his kind; 16 And the owl, and the night hawk, and the cuckow, and the hawk after his kind, 17 And the little owl, and the cormorant, and the great owl, 18 And the swan, and the pelican, and the gier eagle, 19 And the stork, the heron after her kind, and the lapwing, and the bat. 20 All fowls that creep, going upon all four, shall be an abomination unto you. 21 Yet these may ye eat of every flying creeping thing that goeth upon all four, which have legs above their feet, to leap withal upon the earth; 22 Even these of them ye may eat; the locust after his kind, and the bald locust after his kind, and the beetle after his kind, and the grasshopper after his kind. 23 But all other flying creeping things, which have four feet, shall be an abomination unto you. 24 And for these ye shall be unclean: whosoever toucheth the carcase of them shall be unclean until the even. 25 And whosoever beareth ought of the carcase of them shall wash his clothes, and be unclean until the even.
26 The carcases of every beast which divideth the hoof, and is not clovenfooted, nor cheweth the cud, are nclean unto you: every one that toucheth them shall be unclean. 27 And whatsoever goeth upon his paws, among all manner of beasts that go on all four, those are unclean unto you: whoso toucheth their carcase shall be unclean until the even.
28 And he that beareth the carcase of them shall wash his clothes, and be unclean until the even: they are unclean unto you.
29 These also shall be unclean unto you among the creeping things that creep upon the earth; the weasel, and the mouse, and the tortoise after his kind, 30 And the ferret, and the chameleon, and the lizard, and the snail, and the mole. 31 These are unclean to you among all that creep: whosoever doth touch them, when they be dead, shall be unclean until the even.
32 And upon whatsoever any of them, when they are dead, doth fall, it shall be unclean; whether it be any vessel of wood, or raiment, or skin, or sack, whatsoever vessel it be, wherein any work is done, it must be put into water, and it shall be unclean until the even; so it shall be cleansed. 33 And every earthen vessel, whereinto any of them falleth, whatsoever is in it shall be unclean; and ye shall break it. 34 Of all meat which may be eaten, that on which such water cometh shall be unclean: and all drink that may be drunk in every such vessel shall be unclean.
35 And every thing whereupon any part of their carcase falleth shall be unclean; whether it be oven, or ranges for pots, they shall be broken down: for they are unclean, and shall be unclean unto you. 36 Nevertheless a fountain or pit, wherein there is plenty of water, shall be clean: but that which toucheth their carcase shall be unclean. 37 And if any part of their carcase fall upon any sowing seed which is to be sown, it shall be clean. 38 But if any water be put upon the seed, and any part of their carcase fall thereon, it shall be unclean unto you. 39 And if any beast, of which ye may eat, die; he that toucheth the carcase thereof shall be unclean until the even. 40 And he that eateth of the carcase of it shall wash his clothes, and be unclean until the even: he also that beareth the carcase of it shall wash his clothes, and be unclean until the even.
41 And every creeping thing that creepeth upon the earth shall be an abomination; it shall not be eaten. 42 Whatsoever goeth upon the belly, and whatsoever goeth upon all four, or whatsoever hath more feet among all creeping things that creep upon the earth, them ye shall not eat; for they are an abomination. 43 Ye shall not make yourselves abominable with any creeping thing that creepeth, neither shall ye make yourselves unclean with them, that ye should be defiled thereby. [A] A) yourselves abominable: Heb. your souls, etc 44 For I am the LORD your God: ye shall therefore sanctify yourselves, and ye shall be holy; for I am holy: neither shall ye defile yourselves with any manner of creeping thing that creepeth upon the earth. 45 For I am the LORD that bringeth you up out of the land of Egypt, to be your God: ye shall therefore be holy, for I am holy.
46 This is the law of the beasts, and of the fowl, and of every living creature that moveth in the waters, and of every creature that creepeth upon the earth: 47 To make a difference between the unclean and the clean, and between the beast that may be eaten and the beast that may not be eaten.

Appendix 3 Maps of Sudan

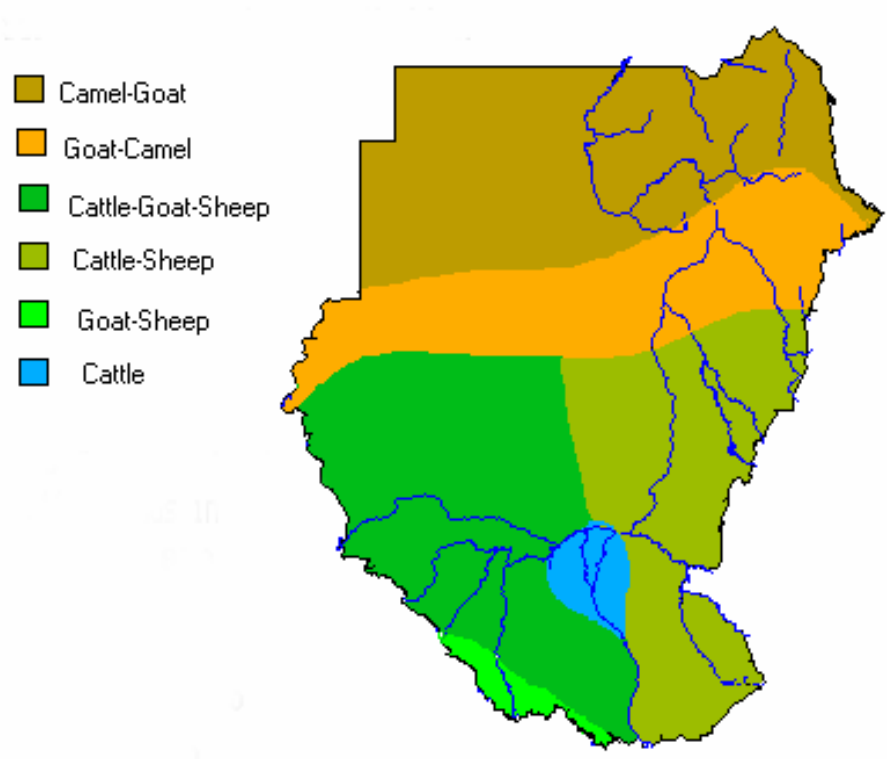
Map 1: Sudan (FAO 2005a)



Map 2: Sudan – Climatic Regions (Walsh 1991: 20)



Map 3: Sudan – Population Density (FAO 2001b)



Map 4: Sudan – Livestock Distribution (FAO 2000a)

Appendix 4 Sudan - Area, Yield, and Production by Crop and Region 1993 - 2004 (according to FAO 1995-2006)

Region	Harvested area ('000 ha)											
	93/94	**94/95**	**95/96**	**96/97**	**97/98**	**98/99**	**99/00**	**00/01**	**01/02**	**02/03**	**03/04**	**04/05**
Sorghum												
Northern	21	107	95	81	36	64	107	58	171	70	120	48
Central	2,019	2,634	2,162	2,582	1,925	2,027	1,348	1,084	1,749	1,256	2,208	960
Eastern	1,622	1,984	1,403	1,843	1,759	2,377	1,355	1,431	1,407	1,429	2,365	999
Kordofan	538	982	559	773	799	627	813	1,003	1,046	1,026	971	799
Darfur	278	312	245	267	269	299	462	193	753	591	448	224
South	205	276	272	706	538	917	550	768	799	631	969	789
Sub-total	*4,683*	*6,295*	*4,736*	*6,252*	*5,326*	*6,311*	*4,635*	*4,537*	*5,925*	*5,003*	*7,081*	*3,819*
Millet												
Northern	0	0	0	0	0	0	0	0	0	0	0	0
Central	60	46	53	70	54	92	125	76	84	91	180	124
Eastern	13	12	14	19	36	19	35	34	32	23	160	21
Kordofan	453	1,697	1,033	906	1,632	1,061	1,079	775	1,146	863	1,049	488
Darfur	529	1,472	1,310	763	1,086	1,571	1,138	1,197	1,660	1,460	1,182	652
South	5	7	8	22	18	20	6	5	15	0	0	0
Sub-total	*1,060*	*3,237*	*2,418*	*1,780*	*2,826*	*2,763*	*2,383*	*2,087*	*2,922*	*2,437*	*2,570*	*1,285*
Wheat												
Northern	55	65	76	97	113	55	63	92	60	67	77	76
Central	288	203	199	191	137	55	19	31	38	37	82	101
Eastern	11	7	31	32	24	28	6	11	2	2	8	2
Kordofan	0	0	0	0	0	0	0	0	0	0	0	0
Darfur	0	3	8	11	3	3	3	4	3	3	2	1
South	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total	*354*	*278*	*314*	*331*	*277*	*141*	*91*	*138*	*103*	*109*	*169*	*180*
TOTAL	**6,097**	**9,810**	**7,468**	**8,363**	**8,429**	**9,215**	**7,109**	**6,762**	**8,950**	**7,549**	**9,821**	**5,282**

Region	Production ('000 t)											
	93/94	**94/95**	**95/96**	**96/97**	**97/98**	**98/99**	**99/00**	**00/01**	**01/02**	**02/03**	**03/04**	**04/05**
Sorghum												
Northern	35	102	93	146	85	93	186	146	369	121	157	83
Central	1,201	1,606	1,282	1,952	1,127	1,738	886	920	1,732	1,010	2,065	910
Eastern	831	1,111	701	1,331	870	1,860	456	734	687	691	1,509	533
Kordofan	141	365	115	287	332	406	261	196	528	365	366	362
Darfur	120	251	154	200	530	200	245	236	480	241	260	102
South	57	104	89	319	215	535	400	529	673	503	824	714
Sub-total	*2,385*	*3,539*	*2,434*	*4,235*	*3,159*	*4,832*	*2,434*	*2,761*	*4,469*	*2,931*	*5,181*	*2,704*
Millet												
Northern	0	0	0	0	0	0	0	0	0	0	0	0
Central	23	14	19	27	24	42	50	27	25	33	75	21
Eastern	6	6	5	8	14	13	14	16	15	9	97	6
Kordofan	36	415	41	116	230	140	123	123	177	165	189	50
Darfur	152	537	319	288	374	468	309	328	363	374	423	200
South	2	1	1	5	6	7	3	3	10	0	0	3
Sub-total	*220*	*973*	*385*	*444*	*648*	*670*	*499*	*497*	*590*	*581*	*784*	*281*
Wheat												
Northern	110	156	194	275	315	108	181	262	162	197	185	215
Central	340	280	305	306	239	36	23	51	66	159	154	216
Eastern	11	9	44	45	40	21	7	17	15	4	14	3
Kordofan	0	0	0	0	0	0	0	0	0	0	0	0
Darfur	0	2	7	14	3	3	3	4	4	4	2	1
South	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total	*461*	*447*	*550*	*640*	*597*	*168*	*214*	*334*	*247*	*364*	*356*	*435*
TOTAL	**3,066**	**4,959**	**3,369**	**5,319**	**4,404**	**5,670**	**3,147**	**3,592**	**5,306**	**3,876**	**6,328**	**3,420**

Region	Yield (t/ha)											
	93/94	**94/95**	**95/96**	**96/97**	**97/98**	**98/99**	**99/00**	**00/01**	**01/02**	**02/03**	**03/04**	**04/05**
Sorghum												
Northern	1,66	0,95	0,98	1,80	2,30	1,45	1,74	2,52	2,16	1,51	1,31	1,72
Central	0,59	0,91	0,59	0,80	0,60	0,86	0,66	0,85	0,99	0,83	0,94	0,95
Eastern	0,51	0,56	0,50	0,70	0,50	0,78	0,34	0,50	0,49	0,42	0,64	0,53
Kordofan	0,26	0,37	0,21	0,40	0,40	0,65	0,32	0,20	0,50	0,36	0,38	0,45
Darfur	0,43	0,81	0,63	0,80	1,90	0,67	0,53	1,22	0,64	0,47	0,58	0,46
South	0,28	0,38	0,33	0,50	0,40	0,58	0,57	0,57	1,00	1,20	0,84	0,90
Sub-total	*0,51*	*0,56*	*0,51*	*0,68*	*0,59*	*0,77*	*0,51*	*0,59*	*0,77*	*0,61*	*0,73*	*0,71*
Millet												
Northern	0,00	0,00	0,00	0,00	0,00	0	0,00	0,00	0,00	0,00	0,00	0,00
Central	0,38	0,30	0,36	0,40	0,40	0,46	0,40	0,36	0,30	0,35	0,42	0,17
Eastern	0,45	0,38	0,36	0,40	0,40	0,68	0,40	0,47	0,47	0,39	0,61	0,31
Kordofan	0,08	0,24	0,04	0,10	0,10	0,13	0,11	0,16	0,15	0,19	0,18	0,10
Darfur	0,29	0,36	0,24	0,40	0,30	0,30	0,27	0,27	0,22	0,28	0,36	0,31
South	0,30	0,22	0,13	0,20	0,30	0,35	0,50	0,60	0,66	0,00	0,00	0,00
Sub-total	*0,21*	*0,30*	*0,16*	*0,25*	*0,23*	*0,24*	*0,21*	*0,24*	*0,20*	*0,25*	*0,30*	*0,22*
Wheat												
Northern	2,02	2,40	2,54	2,80	2,80	2,00	2,87	2,80	2,87	2,39	2,70	2,84
Central	1,18	1,38	1,53	1,60	1,70	0,65	1,21	2,00	1,21	1,71	1,74	2,13
Eastern	0,97	1,28	1,43	1,40	1,70	0,75	1,17	1,00	7,50	2,00	1,75	1,48
Kordofan	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Darfur	0,00	0,79	0,92	1,30	1,00	1,00	1,00	1,00	1,33	1,33	1,00	1,00
South	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Sub-total	*1,30*	*1,61*	*1,75*	*1,93*	*2,16*	*2,10*	*2,35*	*2,42*	*2,40*	*3,34*	*2,10*	*2,42*
Total	**0,50**	**0,51**	**0,45**	**0,64**	**0,52**	**0,68**	**n.a.**	**n.a.**	**n.a.**	**n.a.**	**n.a.**	**n.a.**

Appendix 5 Sudan - Crop Production [t], Production Area [ha], Yield [hg/ha], and Livestock Production [heads] 1961 - 2005 (FAOStat 2006)

Sorghum	**1961/62**	**1962/63**	**1963/64**	**1964/65**	**1965/66**	**1966/67**	**1967/68**	**1968/69**
Production [t]	1,433,600	1,266,220	1,348,400	1,137,748	1,094,427	851,000	1,980,000	869,000
Area [ha]	1,476,917	1,477,468	1,376,560	1,326,410	1,344,051	1,337,115	1,974,200	1,131,057
Yield [hg/ha]	9,707	8,570	9,795	8,578	8,143	6,364	10,029	7,683

Millet	**1961/62**	**1962/63**	**1963/64**	**1964/65**	**1965/66**	**1966/67**	**1967/68**	**1968/69**
Production [t]	213,580	303,365	386,680	356,193	252,983	253,000	368,000	266,000
Area [ha]	331,565	462,504	609,246	603,563	608,201	544,844	609,536	603,655
Yield [hg/ha]	6,442	6,559	6,347	5,902	4,160	4,644	6,037	4,406

Wheat	**1961/62**	**1962/63**	**1963/64**	**1964/65**	**1965/66**	**1966/67**	**1967/68**	**1968/69**
Production [t]	26,400	28,500	30,940	36,765	56,008	68,976	78,446	87,535
Area [ha]	16,400	17,181	22,692	23,331	56,957	57,321	72,465	89,389
Yield [hg/ha]	16,098	16,588	13,635	15,758	9,833	12,033	10,825	9,793

Groundnut	**1961/62**	**1962/63**	**1963/64**	**1964/65**	**1965/66**	**1966/67**	**1967/68**	**1968/69**
Production [t]	265,803	324,792	399,178	349,127	304,600	344,557	322,235	260,743
Area [ha]	198,200	291,700	355,900	327,200	392,700	401,500	356,000	302,248
Yield [hg/ha]	13,411	11,134	11,216	10,670	7,757	8,582	9,052	8,627

Sesame	**1961/62**	**1962/63**	**1963/64**	**1964/65**	**1965/66**	**1966/67**	**1967/68**	**1968/69**
Production [t]	232,000	142,000	173,900	183,700	160,088	133,000	186,368	154,000
Area [ha]	412,000	326,000	497,000	469,000	398,026	388,574	518,333	554,926
Yield [hg/ha]	5,631	4,356	3,499	3,917	4,022	3,423	3,596	2,775

Sugar Cane	**1961/62**	**1962/63**	**1963/64**	**1964/65**	**1965/66**	**1966/67**	**1967/68**	**1968/69**
Production [t]	140,000	140,000	146,000	238,000	195,000	276,000	695,000	967,000
Area [ha]	3,000	3,000	3,781	7,561	7,982	8,402	13,022	14,283
Yield [hg/ha]	466,667	466,667	386,141	314,773	244,300	328,493	533,712	677,029

Tomatoes	**1961/62**	**1962/63**	**1963/64**	**1964/65**	**1965/66**	**1966/67**	**1967/68**	**1968/69**
Production [t]	95,000	95,000	100,000	100,000	100,000	105,000	105,000	105,000
Area [ha]	7,500	7,500	7,500	7,500	8,000	8,800	8,800	9,000
Yield [hg/ha]	126,667	126,667	133,333	133,333	125,000	119,318	119,318	116,667

Camel	**1961/62**	**1962/63**	**1963/64**	**1964/65**	**1965/66**	**1966/67**	**1967/68**	**1968/69**
Head	2,000,000	2,002,000	2,000,000	2,000,000	2,000,000	2,200,000	2,420,000	2,662,000

Cattle	**1961/62**	**1962/63**	**1963/64**	**1964/65**	**1965/66**	**1966/67**	**1967/68**	**1968/69**
Head	7,000,000	7,000,000	8,050,000	9,105,000	9,105,000	10,012,000	11,014,000	12,115,000

Chicken	**1961/62**	**1962/63**	**1963/64**	**1964/65**	**1965/66**	**1966/67**	**1967/68**	**1968/69**
Head	10,000	10,000	12,500	15,000	16,000	17,700	17,900	18,000

Goat	**1961/62**	**1962/63**	**1963/64**	**1964/65**	**1965/66**	**1966/67**	**1967/68**	**1968/69**
Head	6,290,000	6,320,000	6,585,000	6,850,000	6,850,000	7,539,000	8,293,000	9,123,000

Sheep	**1961/62**	**1962/63**	**1963/64**	**1964/65**	**1965/66**	**1966/67**	**1967/68**	**1968/69**
Head	7,848,000	7,851,000	8,255,000	8,660,000	8,660,000	9,526,000	10,478,000	11,526,000

Sorghum	**1969/70**	**1970/71**	**1971/72**	**1972/73**	**1973/74**	**1974/75**	**1975/76**	**1976/77**
Production [t]	1,451,000	1,535,000	1,592,000	1,301,000	1,691,000	1,792,000	2,143,000	2,606,000
Area [ha]	1,695,785	2,055,872	1,913,464	1,720,228	2,287,756	2,342,786	2,731,360	2,822,937
Yield [hg/ha]	8,557	7,466	8,320	7,563	7,392	7,649	7,846	9,232

Millet	**1969/70**	**1970/71**	**1971/72**	**1972/73**	**1973/74**	**1974/75**	**1975/76**	**1976/77**
Production [t]	388,000	439,000	441,000	355,000	285,000	403,000	388,000	449,000
Area [ha]	633,481	728,839	873,346	1,112,372	1,140,097	1,085,487	1,055,040	1,127,075
Yield [hg/ha]	6,125	6,023	5,050	3,191	2,500	3,713	3,678	3,984

Wheat	**1969/70**	**1970/71**	**1971/72**	**1972/73**	**1973/74**	**1974/75**	**1975/76**	**1976/77**
Production [t]	123,200	115,300	163,000	124,000	152,000	235,000	269,000	263,000
Area [ha]	110,270	121,907	121,403	120,983	104,100	176,000	248,267	291,536
Yield [hg/ha]	11,173	9,458	13,426	10,249	14,601	13,352	10,835	9,021

Groundnut	**1969/70**	**1970/71**	**1971/72**	**1972/73**	**1973/74**	**1974/75**	**1975/76**	**1976/77**
Production [t]	384,700	339,000	387,000	569,000	553,000	928,000	782,000	734,000
Area [ha]	450,662	383,953	634,741	689,771	734,300	752,783	971,645	799,412
Yield [hg/ha]	8,536	8,829	6,097	8,249	7,531	12,328	8,048	9,182

Sesame	**1969/70**	**1970/71**	**1971/72**	**1972/73**	**1973/74**	**1974/75**	**1975/76**	**1976/77**
Production [t]	174,000	297,000	296,000	340,000	244,000	224,000	233,000	237,000
Area [ha]	571,729	780,089	807,394	1,195,968	935,938	914,934	954,842	943,500
Yield [hg/ha]	3,043	3,807	3,666	2,843	2,607	2,448	2,440	2,512

Sugar Cane	**1969/70**	**1970/71**	**1971/72**	**1972/73**	**1973/74**	**1974/75**	**1975/76**	**1976/77**
Production [t]	938,725	826,000	710,000	877,000	1,097,000	1,153,000	1,291,000	1,406,000
Area [ha]	13,863	11,762	12,182	13,022	14,703	14,703	16,800	15,000
Yield [hg/ha]	677,144	702,262	582,827	673,476	746,106	784,194	768,452	937,333

Tomatoes	**1969/70**	**1970/71**	**1971/72**	**1972/73**	**1973/74**	**1974/75**	**1975/76**	**1976/77**
Production [t]	107,000	110,000	110,000	120,000	130,000	125,000	120,000	114,000
Area [ha]	9,000	9,200	9,242	10,502	10,922	10,600	10,500	10,000
Yield [hg/ha]	118,889	119,565	119,022	114,264	119,026	117,925	114,286	114,000

Camel	**1969/70**	**1970/71**	**1971/72**	**1972/73**	**1973/74**	**1974/75**	**1975/76**	**1976/77**
Head	2,500,000	2,414,000	2,570,000	2,570,000	2,646,000	2,698,000	2,750,000	2,782,000

Cattle	**1969/70**	**1970/71**	**1971/72**	**1972/73**	**1973/74**	**1974/75**	**1975/76**	**1976/77**
Head	12,000,000	12,300,000	12,600,000	12,900,000	13,972,000	14,223,000	15,220,000	15,281,000

Chicken	**1969/70**	**1970/71**	**1971/72**	**1972/73**	**1973/74**	**1974/75**	**1975/76**	**1976/77**
Head	18,200	18,500	18,800	19,000	19,200	20,960	22,000	23,000

Goat	**1969/70**	**1970/71**	**1971/72**	**1972/73**	**1973/74**	**1974/75**	**1975/76**	**1976/77**
Head	8,600,000	8,804,000	8,804,000	8,804,000	9,701,000	10,496,000	10,853,000	11,254,000

Sheep	**1969/70**	**1970/71**	**1971/72**	**1972/73**	**1973/74**	**1974/75**	**1975/76**	**1976/77**
Head	11,500,000	11,358,000	11,400,000	11,478,000	12,480,000	13,373,000	13,774,000	14,494,000

Sorghum	**1977/78**	**1978/79**	**1979/80**	**1980/81**	**1981/82**	**1982/83**	**1983/84**	**1984/85**
Production [t]	2,082,000	2,353,000	1,461,000	2,084,000	3,335,000	1,884,000	2,006,000	1,097,000
Area [ha]	2,888,470	2,901,492	2,357,069	2,927,117	3,915,565	3,555,557	3,689,142	3,355,000
Yield [hg/ha]	7,208	8,110	6,198	7,120	8,517	5,299	5,438	3,270

Millet	**1977/78**	**1978/79**	**1979/80**	**1980/81**	**1981/82**	**1982/83**	**1983/84**	**1984/85**
Production [t]	500,000	552,000	309,000	335,000	509,000	227,000	314,000	168,000
Area [ha]	1,282,504	1,299,728	974,586	1,091,560	1,227,894	998,950	1,270,000	1,439,194
Yield [hg/ha]	3,899	4,247	3,171	3,069	4,145	2,272	2,472	1,167

Wheat	**1977/78**	**1978/79**	**1979/80**	**1980/81**	**1981/82**	**1982/83**	**1983/84**	**1984/85**
Production [t]	289,000	312,000	165,000	231,000	218,000	142,000	176,000	157,000
Area [ha]	265,911	247,427	241,126	190,716	183,575	138,206	94,518	140,727
Yield [hg/ha]	10,868	12,610	6,843	12,112	11,875	10,275	18,621	11,156

Groundnut	**1977/78**	**1978/79**	**1979/80**	**1980/81**	**1981/82**	**1982/83**	**1983/84**	**1984/85**
Production [t]	1,032,000	806,000	858,000	712,000	738,000	455,000	405,000	378,000
Area [ha]	1,126,655	983,407	988,448	894,180	998,110	655,745	765,385	717,497
Yield [hg/ha]	9,160	8,196	8,680	7,963	7,394	6,939	5,291	5,268

Sesame	**1977/78**	**1978/79**	**1979/80**	**1980/81**	**1981/82**	**1982/83**	**1983/84**	**1984/85**
Production [t]	263,000	216,000	222,000	221,000	242,000	140,000	206,000	130,000
Area [ha]	993,909	857,383	831,338	846,041	858,643	512,498	914,340	767,906
Yield [hg/ha]	2,646	2,519	2,670	2,612	2,818	2,732	2,253	1,693

Sugar Cane	**1977/78**	**1978/79**	**1979/80**	**1980/81**	**1981/82**	**1982/83**	**1983/84**	**1984/85**
Production [t]	1,584,000	1,551,000	1,100,000	1,283,000	2,400,076	2,669,951	3,680,293	4,545,100
Area [ha]	18,000	25,428	25,625	22,450	36,694	44,012	52,756	63,618
Yield [hg/ha]	880,000	609,957	429,268	571,492	654,079	606,642	697,607	714,436

Tomatoes	**1977/78**	**1978/79**	**1979/80**	**1980/81**	**1981/82**	**1982/83**	**1983/84**	**1984/85**
Production [t]	105,000	100,000	78,000	70,966	92,400	116,160	154,000	152,000
Area [ha]	9,500	7,500	5,500	4,259	5,545	8,500	13,000	13,000
Yield [hg/ha]	110,526	133,333	141,818	166,626	166,637	136,659	118,462	116,923

Camel	**1977/78**	**1978/79**	**1979/80**	**1980/81**	**1981/82**	**1982/83**	**1983/84**	**1984/85**
Head	2,361,000	2,441,000	2,524,000	2,610,000	2,698,692	2,790,000	2,764,000	2,797,000

Cattle	**1977/78**	**1978/79**	**1979/80**	**1980/81**	**1981/82**	**1982/83**	**1983/84**	**1984/85**
Head	15,367,229	15,941,000	17,300,000	18,354,416	19,474,000	20,662,000	20,500,000	21,033,008

Chicken	**1977/78**	**1978/79**	**1979/80**	**1980/81**	**1981/82**	**1982/83**	**1983/84**	**1984/85**
Head	24,000	25,000	26,000	27,000	28,000	28,000	30,000	30,072

Goat	**1977/78**	**1978/79**	**1979/80**	**1980/81**	**1981/82**	**1982/83**	**1983/84**	**1984/85**
Head	11,300,000	11,763,000	12,246,000	12,748,000	13,270,000	13,814,000	13,707,000	14,083,000

Sheep	**1977/78**	**1978/79**	**1979/80**	**1980/81**	**1981/82**	**1982/83**	**1983/84**	**1984/85**
Head	16,222,000	16,676,000	17,143,008	17,623,008	18,117,008	18,624,000	19,332,000	19,970,000

Sorghum	**1985/86**	**1986/87**	**1987/88**	**1988/89**	**1989/90**	**1990/91**	**1991/92**	**1992/93**
Production [t]	3,597,000	3,277,000	1,363,000	4,425,000	1,536,000	1,180,000	3,581,000	4,042,000
Area [ha]	5,526,152	4,959,040	3,389,630	5,578,242	3,801,304	2,759,400	5,100,191	6,200,000
Yield [hg/ha]	6,509	6,608	4,021	7,933	4,041	4,276	7,021	6,519

Millet	**1985/86**	**1986/87**	**1987/88**	**1988/89**	**1989/90**	**1990/91**	**1991/92**	**1992/93**
Production [t]	417,000	285,000	153,000	495,000	161,000	85,000	308,000	449,000
Area [ha]	1,734,090	1,544,210	1,095,990	2,385,214	1,559,754	661,500	1,118,460	1,558,495
Yield [hg/ha]	2,405	1,846	1,396	2,075	1,032	1,285	2,754	2,881

Wheat	**1985/86**	**1986/87**	**1987/88**	**1988/89**	**1989/90**	**1990/91**	**1991/92**	**1992/93**
Production [t]	79,000	199,000	157,000	181,000	247,000	409,000	686,000	838,000
Area [ha]	48,300	151,200	118,460	144,090	165,000	257,929	462,928	379,000
Yield [hg/ha]	16,356	13,161	13,253	12,562	14,970	15,857	14,819	22,111

Groundnut	**1985/86**	**1986/87**	**1987/88**	**1988/89**	**1989/90**	**1990/91**	**1991/92**	**1992/93**
Production [t]	286,000	379,000	432,000	587,000	218,000	123,000	180,000	380,000
Area [ha]	427,641	541,900	684,300	682,630	544,004	223,060	229,363	545,260
Yield [hg/ha]	6,688	6,994	6,313	8,599	4,007	5,514	7,848	6,969

Sesame	**1985/86**	**1986/87**	**1987/88**	**1988/89**	**1989/90**	**1990/91**	**1991/92**	**1992/93**
Production [t]	134,000	216,000	233,000	194,000	140,000	80,000	97,000	266,000
Area [ha]	1,057,761	938,000	960,000	1,174,125	1,101,450	463,740	537,600	1,347,195
Yield [hg/ha]	1,267	2,303	2,427	1,652	1,271	1,725	1,804	1,974

Sugar Cane	**1985/86**	**1986/87**	**1987/88**	**1988/89**	**1989/90**	**1990/91**	**1991/92**	**1992/93**
Production [t]	4,800,000	4,500,000	4,750,000	3,518,000	3,664,000	4,222,000	4,498,000	4,474,000
Area [ha]	70,000	80,000	82,000	62,160	63,420	65,520	67,213	65,112
Yield [hg/ha]	685,714	562,500	579,268	565,959	577,736	644,383	669,216	687,124

Tomatoes	**1985/86**	**1986/87**	**1987/88**	**1988/89**	**1989/90**	**1990/91**	**1991/92**	**1992/93**
Production [t]	170,000	200,000	250,000	300,000	350,000	400,000	500,000	550,000
Area [ha]	13,000	15,000	19,000	23,000	27,000	31,000	38,000	42,000
Yield [hg/ha]	130,769	133,333	131,579	130,435	129,630	129,032	131,579	130,952

Camel	**1985/86**	**1986/87**	**1987/88**	**1988/89**	**1989/90**	**1990/91**	**1991/92**	**1992/93**
Head	2,806,000	2,713,000	2,705,117	2,722,427	2,731,799	2,741,633	2,756,982	2,787,000

Cattle	**1985/86**	**1986/87**	**1987/88**	**1988/89**	**1989/90**	**1990/91**	**1991/92**	**1992/93**
Head	20,942,000	19,632,000	19,737,872	19,858,288	20,583,000	21,027,800	21,630,000	25,092,000

Chicken	**1985/86**	**1986/87**	**1987/88**	**1988/89**	**1989/90**	**1990/91**	**1991/92**	**1992/93**
Head	29,673	30,027	30,535	30,535	31,387	32,263	33,463	35,000

Goat	**1985/86**	**1986/87**	**1987/88**	**1988/89**	**1989/90**	**1990/91**	**1991/92**	**1992/93**
Head	14,266,000	13,799,000	13,942,248	14,195,996	14,843,400	15,276,800	18,650,000	22,693,000

Sheep	**1985/86**	**1986/87**	**1987/88**	**1988/89**	**1989/90**	**1990/91**	**1991/92**	**1992/93**
Head	19,709,008	18,691,008	18,806,560	19,207,136	20,167,500	20,700,000	23,043,000	26,518,000

Sorghum	**1993/94**	**1994/95**	**1995/96**	**1996/97**	**1997/98**	**1998/99**	**1999/00**	**2000/01**
Production [t]	2,386,000	3,648,000	2,450,000	4,179,000	2,870,000	4,284,000	2,347,000	2,488,000
Area [ha]	4,683,840	6,427,260	5,045,000	6,552,840	5,329,000	6,314,000	4,529,600	4,195,000
Yield [hg/ha]	5,094	5,676	4,856	6,377	4,378	6,785	5,181	5,931

Millet	**1993/94**	**1994/95**	**1995/96**	**1996/97**	**1997/98**	**1998/99**	**1999/00**	**2000/01**
Production [t]	221,000	973,000	385,000	440,000	643,000	670,000	499,000	496,000
Area [ha]	1,068,900	3,236,940	2,418,360	1,633,380	2,809,000	2,762,000	2,393,580	2,087,000
Yield [hg/ha]	2,068	3,006	1,592	2,694	2,289	2,426	2,085	2,377

Wheat	**1993/94**	**1994/95**	**1995/96**	**1996/97**	**1997/98**	**1998/99**	**1999/00**	**2000/01**
Production [t]	453,000	475,000	448,000	527,000	642,000	585,000	172,000	214,000
Area [ha]	328,502	357,488	278,040	297,780	329,280	255,000	142,000	91,980
Yield [hg/ha]	13,790	13,287	16,113	17,698	19,497	22,941	12,113	23,266

Groundnut	**1993/94**	**1994/95**	**1995/96**	**1996/97**	**1997/98**	**1998/99**	**1999/00**	**2000/01**
Production [t]	428,000	714,000	738,000	815,000	1,104,000	776,000	1,047,000	947,000
Area [ha]	780,360	887,460	1,083,600	945,420	1,531,740	1,386,840	1,514,940	1,462,719
Yield [hg/ha]	5,485	8,045	6,811	8,621	7,207	5,595	6,911	6,474

Sesame	**1993/94**	**1994/95**	**1995/96**	**1996/97**	**1997/98**	**1998/99**	**1999/00**	**2000/01**
Production [t]	175,000	170,000	313,000	416,000	281,000	262,000	329,000	282,000
Area [ha]	1,231,250	1,346,520	1,493,520	1,860,600	1,581,700	1,404,060	2,174,340	2,006,340
Yield [hg/ha]	1,421	1,263	2,096	2,236	1,777	1,866	1,513	1,406

Sugar Cane	**1993/94**	**1994/95**	**1995/96**	**1996/97**	**1997/98**	**1998/99**	**1999/00**	**2000/01**
Production [t]	4,126,000	4,282,000	4,662,000	5,076,000	5,746,150	5,741,700	5,320,691	4,981,781
Area [ha]	64,272	61,740	64,680	63,864	69,000	71,313	75,899	63,538
Yield [hg/ha]	641,959	693,554	720,779	794,814	832,775	805,141	701,023	784,063

Tomatoes	**1993/94**	**1994/95**	**1995/96**	**1996/97**	**1997/98**	**1998/99**	**1999/00**	**2000/01**
Production [t]	580,000	600,000	620,000	640,000	650,000	670,000	707,000	653,520
Area [ha]	45,000	46,000	48,000	49,000	50,000	52,000	51,310	51,240
Yield [hg/ha]	128,889	130,435	129,167	130,612	130,000	128,846	137,790	127,541

Camel	**1993/94**	**1994/95**	**1995/96**	**1996/97**	**1997/98**	**1998/99**	**1999/00**	**2000/01**
Head	2,849,000	2,886,000	2,903,000	2,915,000	2,936,000	2,974,000	3,031,000	3,108,000

Cattle	**1993/94**	**1994/95**	**1995/96**	**1996/97**	**1997/98**	**1998/99**	**1999/00**	**2000/01**
Head	27,571,000	29,000,000	30,077,000	31,669,000	33,103,000	34,584,000	35,825,000	37,093,000

Chicken	**1993/94**	**1994/95**	**1995/96**	**1996/97**	**1997/98**	**1998/99**	**1999/00**	**2000/01**
Head	35,100	35,229	37,511	39,715	37,000	36,256	36,586	36,465

Goat	**1993/94**	**1994/95**	**1995/96**	**1996/97**	**1997/98**	**1998/99**	**1999/00**	**2000/01**
Head	27,567,700	33,319,000	35,215,000	35,216,000	36,037,000	36,498,000	37,346,000	38,548,000

Sheep	**1993/94**	**1994/95**	**1995/96**	**1996/97**	**1997/98**	**1998/99**	**1999/00**	**2000/01**
Head	30,977,000	37,145,000	37,180,000	37,202,000	39,835,000	42,363,000	44,802,000	46,095,000

Sorghum	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**
Production [t]	4,394,000	2,825,000	5,188,000	2,600,000	4,275,000
Area [ha]	5,742,240	5,003,000	7,081,000	6,000,000	8,000,000
Yield [hg/ha]	7,652	5,647	7,327	4,333	5,285

Millet	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**
Production [t]	578,000	581,000	784,000	500,000	663,000
Area [ha]	2,586,000	2,437,000	2,570,000	2,850,000	2,800,000
Yield [hg/ha]	2,235	2,384	3,051	1,754	2,368

Wheat	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**
Production [t]	303,000	247,000	332,000	467,000	400,000
Area [ha]	120,120	115,500	150,000	170,000	170,000
Yield [hg/ha]	25,225	21,385	22,133	27,470	23,529

Groundnut	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**
Production [t]	990,000	1,267,000	1,200,000	1,200,000	1,200,000
Area [ha]	1,531,320	1,350,200	1,900,000	1,900,000	1,900,000
Yield [hg/ha]	6,465	9,384	6,316	6,316	6,316

Sesame	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**
Production [t]	296,000	122,000	325,000	300,000	300,000
Area [ha]	1,587,600	1,174,320	850,000	1,660,000	1,700,000
Yield [hg/ha]	1,864	1,039	3,824	3,824	3,824

Sugar Cane	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**
Production [t]	5,503,290	5,500,000	5,500,000	5,500,000	5,500,000
Area [ha]	63,840	63,480	65,000	65,000	65,000
Yield [hg/ha]	862,044	866,415	846,154	846,154	846,154

Tomatoes	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**
Production [t]	707,000	707,000	700,000	700,000	700,000
Area [ha]	51,240	51,240	52,000	52,000	52,000
Yield [hg/ha]	137,978	137,978	134,615	134,615	134,615

Camel	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**
Head	3,203,000	3,342,000	3,300,000	3,300,000	3,300,000

Cattle	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**
Head	38,325,000	38,183,000	38,325,000	38,325,000	38,325,000

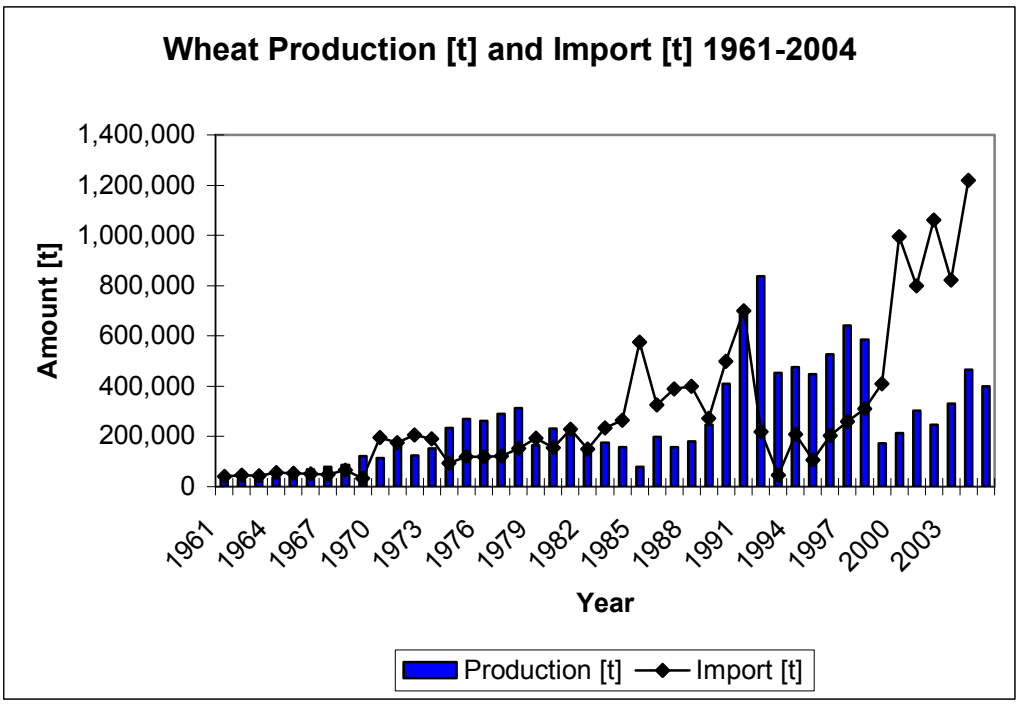
Chicken	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**
Head	36,820	37,000	37,000	37,000	37,000

Goat	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**
Head	39,952,000	41,485,000	42,000,000	42,000,000	42,000,000

Sheep	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**
Head	47,043,000	48,136,000	48,000,000	48,000,000	48,000,000

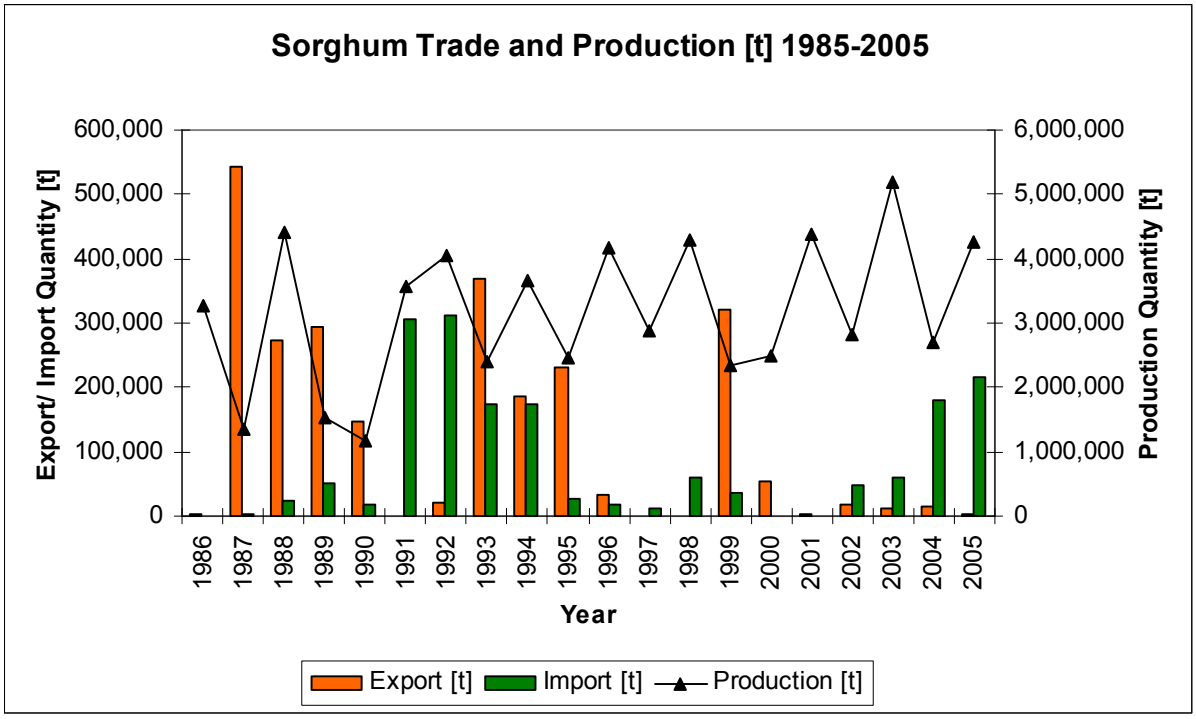
Appendix 6 Sudan - Wheat Production and Import [t] 1961 - 2004 (FAOStat 2006)

Year	Wheat Production [t]	Wheat Import [t]
1961	26,400	41,000
1962	28,500	46,000
1963	30,940	44,300
1964	36,765	54,800
1965	56,008	54,600
1966	68,976	49,998
1967	78,446	49,080
1968	87,535	65,525
1969	123,200	32,183
1970	115,300	194,785
1971	163,000	175,726
1972	124,000	205,487
1973	152,000	190,311
1974	235,000	94,318
1975	269,000	119,179
1976	263,000	119,527
1977	289,000	122,030
1978	312,000	153,278
1979	165,000	192,942
1980	231,000	156,081
1981	218,000	229,890
1982	142,000	149,138
1983	176,000	234,735
1984	157,000	265,000
1985	79,000	576,000
1986	199,000	325,000
1987	157,000	389,000
1988	181,000	400,000
1989	247,000	272,137
1990	409,000	500,000
1991	686,000	700,000
1992	838,000	220,000
1993	453,000	46,833
1994	475,000	207,672
1995	448,000	107,381
1996	527,000	202,651
1997	642,000	258,987
1998	585,000	310,255
1999	172,000	409,265
2000	214,000	995,488
2001	303,000	798,099
2002	247,000	1,060,626
2003	332,000	821,746
2004	467,000	1,219,154



Appendix 7 Sorghum Production, Export and Import [t] 1986 - 2005 (FAOStat 2006)

Year	Production [t]	Exports [t]	Import [t]
1986	3,277,000	2,803	1,083
1987	1,363,000	543,981	2,436
1988	4,425,000	271,686	25,260
1989	1,536,000	293,168	49,967
1990	1,180,000	146,137	19,192
1991	3,581,000	297	305,490
1992	4,042,000	20,139	311,596
1993	2,386,000	369,048	173,955
1994	3,648,000	185,616	174,785
1995	2,450,000	230,651	25,669
1996	4,179,000	31,701	18,837
1997	2,870,000	n.a.	10,584
1998	4,284,000	722	60,417
1999	2,347,000	321,121	35,868
2000	2,488,000	54,005	n.a.
2001	4,394,000	1,651	n.a.
2002	2,825,000	18,501	46,511
2003	5,188,000	12,370	60,558
2004	2,704,000	13,855	181,042
2005	4,275,000	3,053	215,468



Appendix 8 Effects of Anti-nutrients Present in Plant Foods (FAO 2000b: 21)

Anti-nutrient	**Effects**
Phytohemagglutinins (lectins)	Growth depression, fatal
Protease inhibitors	Pancreatic hypertrophy, dietary loss of S-amino acids, reduced protein utilization
Arnylase inhibitors	Amylase inhibition, may hinder carbohydrate utilization
Flatulent factors	Flatus resulting in discomfort, abdominal rumblings, cramps, pain, and diarrhea
Phytate	Reduced mineral bio-availability, altered protein solubility, enzyme inhibition
Oxalates	Chelation of dietary divalent cations and reduced bio-availability
Polyphenols (tannins)	Reduction in protein digestibility and utilization, inhibition of several enzymes
Cyanogens	Cyanide poisoning, act as progoitrogens
Goitrogens	Inhibition of iodine binding to thyroid gland
Saponins	Bitter taste, foaming, hemolysis
Allergens	Several allergic reactions
Lathydrogens	Neurotoxic, nervous paralysis of lower limbs, fatal
Favisin	Hemolytic anemia
Off-flavours	Loss of certain amino acids, reduced product acceptability to consumers
Phytoalexins	Hemolysis, uncouple oxidative phosphorylation
Estrogens	Growth inhibition, interference with reproduction
Lysionoalanine	Nephrotoxicity, reduction in available lysine, kidney cell nucleus and cytoplasm enlargement
Amino acid racemization	Generation of D-amino acids, may act as synergist to lysinoalanine in expression of nephrocytomegaly
Toxic amino acids	Structural analogs of protein amino acids, act as antimetabolites, potent inhibitors of several enzyme systems
Anti-vitamins	Increased vitamin requirements, rachitogenic, liver necrosis, muscular dystrophy

Appendix 9 Microorganisms Commonly Found in Fermenting Fruits and Vegetables (FAO 1998: 17)

Organism	**Type**	**Optimum conditions**	**Reactions**
Acetobacter genus A. aceti A. pasteurianus A. peroxydans	Aerobic rods	a_w > =0.9	Oxidise organic compounds (alcohol) to organic acids (acetic acid). Important in vinegar production.
Streptococcaceae Family	Gram positive cocci	Acid tolerant a_w > =0.9	
Streptococcus genus S. faecalis S. bovis S. thermophilus			Homofermentative. Most common in dairy fermentations, but S. Faecalis is common in vegetable products. Tolerate salt and can grow in high pH media.
Leuconostoc genus L. mesenteroides L. dextranicum L. paramesenteroides L. oenos	Gram positive cocci		Heterofermentative. Produce lactic acid, plus acetic acid, ethanol and carbon dioxide from glucose. Small bacteria, therefore have an important role in initiating fermentations. L. oenos is often present in wine. It can utilise malic acid and other organic acids.
Pediococcus genus P. cerevisiae P. acidilactici P. pentosaceus			Saprophytic organisms found in fermenting vegetables, mashes, beer and wine. Produce inactive lactic acid.
Lactobacillaceae Family	Gram positive rods. Non-motile	Acid tolerant a_w > =0.9	Metabolise sugars to lactic acid, acetic acid, ethyl alcohol and carbon dioxide.
Lactobacillus genus			The genus is split into two types – homo- and hetero-fermenters. Saprophytic organisms. Produce greater amounts of acid than the cocci
Homofermentative Lactobacillus spp. L. delbrueckii L. leichmannii L. plantarum L. lactis L. acidophilus			Produce only lactic acid. L. plantarum important in fruit and vegetable fermentation. Tolerates high salt concentration.
Heterofermentative Spp. L. brevis L. fermentum L. buchneri			Produce lactic acid (50per cent) plus acetic acid (25per cent), ethyl alcohol and carbon dioxide (25per cent). L. brevis is the most common. Widely distributed in plants and animals. Partially reduces fructose to mannitol.
Yeasts		Tolerate acid, 40per cent sugar a_w > =0.85	
Saccharomyces Cerevisiae S. pombe	Many aerobic, some anaerobes	pH 4-4.5 20 - 30° C	S. cerevisiae can shift its metabolism from a fermentative to an oxidative pathway, depending on oxygen availability. Most yeasts produce alcohol and carbon dioxide from sugars.
Debaromyces Zygosaccharomyces rouxii Candida species Geotrichum candidum			Tolerant of high salt concentrations Tolerates high salt concentration and low a_w

Appendix 10 Some Mulahs for Aceda and Kisra (cf. Dirar 1993: 483-485)

Class	Local name of mulah	Major characterizing component
A. Leaves	1. Um-takashu (um-barid) (um-kashatien)	Dry mulukhiya (jew's mallow) leaves in cold water
	2. Mulah khudra (mafrukat-mulukhiya)	Fresh leaves of mulukhiya
	3. Mulah warag	Fresh leaves of cowpea
	4. Mulah tabaldi	Fresh leaves of bao-bao
	5, Mulah hijlij	Fresh leaves of Balanites aegyptiacce
	6. Mulah sabarog	Fresh leaves of okra
	7. Mulah bafra	Fresh leaves of cassava
	8. Mulah kawal	Dry, fermented leaf paste of sickle-pod
	9. Mulah kerkedeh	Fresh leaves of roselle
	10. Mulah lawass	Dry, fermented, spoiled onion bulbs
B. Beans, seeds and fruits	11. Mulah um-shieifa	Dried, ground okra pods
	12. Mafrukat-bamia	Fresh okra pods
	13. Mulah lubia	Cowpea beans
	14. Mulah adass	Lentil seeds
	15. Mulah furundu	Dry, fermented paste of roselle seeds
	16, Mulah sigda	Fermented sesame press cake
	17. Mulah kerjigil	Fermented mixture of pumpkin, cowpea and sesame pastes
C. Dairy	18. Mulah rob	Rob (butter milk) + dry okra powder (weika)
	19. Mulah taktoka	Rob + sorghum flour
	20. Mulah nieimiya	Rob+ minced meat + onions + oil + etc.
	21. Mulah kush-kush	Kush-kush cheese
	22. Mulah biruni	Ripened, fermented milk
	23. Mulah laban	Fresh milk + weika
	24. Mulah weikab	Fresh milk + combu
D. Dairy substi-tutes	25. Mulah um-zummata	Water-melon juice
	26. Mulah moyat-aish	Steep water of soured millet grains
	27. Mulah rob-heb	Soured water-melon seed paste
	28. Mulah rob ful	Soured peanut paste

Class	Local name of mulah	Major characterizing component
E. Fish	29. Mulah hout	Fresh fish flesh extract
	30. Mulah fessiekh	Fessiekh: fermented fish
	31, Mulah terkin	Terkin: fermented fish paste or sauce
	32. Mulah kejeik	Kejeik: sun-dried fish
	33. Mulah mindeshi	Mindeshi: fermented fish paste (moist or air-dry)
F. Meat, fat and offals	34. Mulah laham	Fresh meat
	35. Mulah um-rigeiga	Fresh meat extract
	36. Mulah shermout	Shermout: dry meat strips
	37. Mulah tagaliya	Minced meat + fried onions + tomato paste
	38. Mulah um-tibay	Um-tibay: fermented chopped meat of various cuts
	39. Mulah beirta	Beirta: fermented offals
	40. Mulah shin	Shin: fermented sausage
	41. Mulah mussran	Mussran: fermented small intestines
	42. Mulah miriss	Miriss: fermented fat
	43. Mulah jerbi-jerbi	Jerbi-jerbi: fermented wild rabbit whole carcass
G. Insects, amphibian and rodents	44. Mulah duga	Duga: fermented locusts
	45. Mulah beiga (doud-maneh)	Beiga: fresh or fermented caterpillars
	46. Mulah kesherneh	Kesherneh: fermented frogs
	47. Mulah far	Fresh rat meat
H. Fungi	48. Mulah suweid	Sorghum head smut spores
	49. Mulah rute	Various wild mushrooms
I. Cow urine	50. Mulah okah	Okah: fermented cow urine

Appendix 11 Guideline Fieldwork Sudan

Information about the location (El Obeid, North Kordofan)

1. Geography of the region (topography, climate)
2. History of the town/ region
3. Size and composition of the population (ethnic, family structure, occupation)
4. Infrastructure of the town/ region (technical and social)
5. Macroeconomic/ socio-economic situation (industry, agriculture, service, markets)
6. Means of existence (e.g. subsistence farming, cash cropping, trade, industry, formal, informal sector)
7. Political situation/ power structure/ administration/ non-governmental organisations
8. Cultural background (e.g. ethnics, religion, traditions, customs…)

Interviews with key informants (political and economic framework)

1. Main statements of agricultural policy
2. Decision makers (local, central)
3. Subsidies and taxes on agricultural/ food products
4. Subsidies and taxes on food imports/ exports
5. Floor prices for agricultural food products
6. Credit policies for agricultural production, food production, industrial food processing
7. Trade policies or trade restrictions for food products
8. Policies for food security/ sovereignty, self-sufficiency
9. Absorption of policies (central government – local government - district leaders – farmers, merchants)
10. Local transformation of policies
11. Integration of local knowledge into policies
12. Current situation of food security and current plan of action/ action taking

Markets in El Obeid

1. Types, number, location of markets/ shops
2. Opening hours, infrastructure, transport
3. Access suppliers/demanders (gender, age, ethnics, religion)
4. Type of goods (local, national, international)
5. Traders (small producers, petty traders, merchants, wholesalers)
6. Supply and demand regarding seasons (food, food related items, convenience, luxury food)
7. Prices depending on season (food, food related items, convenience, luxury food), determinants of prices
8. Auctions, fees, taxes, illegal trade
9. Selling/ shopping behaviour (gender, age, ethnics, religion)
10. Market for street food

Information about the household/ household food habits

Background information about the living area

1. Name/ location of the town quarter
2. Infrastructure of the area (transportation, electricity, water, markets/ shops, service)

3. Neighbourhood structures

Background information about the household

4. Description of housing (size of house/ rooms/ yard, type/ materials of house, divisions of the house/ yard)
5. Family composition (adults, children)
6. Property/ resources of the household (house, land, animal, cars, equipment, household goods)
7. Place of origin, date and reason for leaving
8. ethnical/ cultural background
9. Occupation/ activity in place of origin
10. Length of time in present location
11. Occupation/ activity in present location
12. Future plans to stay
13. Income distribution/ type of income (kind of activity) (from employment, production)
14. Access to services (health, education, transport, water, electricity)
15. Access to market
16. Social networks (neighbourhood, relatives, friends) regarding types of exchanges (material, non-material)

Food supply

17. Kind of food consumed (raw, local, national, international, industrial, convenient products)
18. Kind of food/ food related items purchased
19. Kind of trade (market, shop, gifts, surroundings, own production[162])
20. Access to market; who does food shopping?
21. Kind of income spend for food shopping (whose, what from)
22. Kind of income spend for food shopping for special occasions
23. Access to income/ money for food
24. Time and frequency of shopping
25. Decision making on what is bought and spend
26. Responsibility for income provision, food supply/ shopping
27. External factors on food supply (political, economic - substitutions, taxes, preferential treatment to urban population, sanctions, civil war)
28. Cultural/traditional norms and rules for food supply

Food preservation/ storage

29. Kind of food storage
30. Methods of preservation/ storage (fermenting, salting, drying, smoking, pickling)
31. Place/ time/ frequency/ duration of food storage
32. Person who stores/preserves food / responsible for food storage/ preservation
33. Access to knowledge/ technology
34. Access to/ ownership/ distributor of stored food
35. Reason of food storage/ preservation

[162] In that case food production has to be reflected.

36. Responsibility for food preservation/ storage
37. Cultural/traditional norms and rules for food storage/ preservation

Food preparation

38. Fuel: type, availability, access, distance to collecting place, purchase/ way of collecting, provision (collecting, paying)
39. Why is this fuel used? (expenses, quality, temperature to prepare a certain dish…)
40. Water: kind of supply, availability, quality, access, distance to collecting place, provision (collecting, paying)
41. Priority for water usage (drinking, cooking, cleaning, washing)
42. Kind of stoves
43. Cooking place
44. Kitchen utensils: availability, type, access, way of use, provision (buying, gifts, self-made)
45. Ingredients, spices: type, availability, access, way of use
46. Types of prepared food
47. Preparation methods (boiling, parboiling, stewing, steaming, baking, frying, grilling, roasting, smoking, salting, pickling, fermenting, rotting, drying in air, sun or machine, eaten raw)
48. Drinks, preparation methods
49. Cooking: Who cooks which dish?
50. Assistance in food/ drink preparation (different kinds of dishes/ drinks)
51. Time, duration, frequency, place of food/ drink preparation (different kinds of dishes/ drinks)
52. Special occasions: types of food/ dinks, preparation, responsibility
53. Knowledge of food preparation, preparation of different dishes, ingredients, processes during preparation
54. Responsibility for food preparation
55. External factors on food preparation (e.g. impacts on water/ fuel supply …)
56. Cultural/traditional norms and rules for food preparation/ fuel or water usage
    a) Why is this dish prepared? Why is it prepared that way? Why is it prepared by this person?
    b) What meaning does that way of food preparation have (for the individual/ household/ community)?
    c) Are there any special kinds of food preparation for a kind of group or special occasions?
    d) Are there classifications for certain preparation methods (e.g. only cooked food is a sufficient meal …)
    e) Are there any preparation methods avoided (in general or for a certain kind of group)?

Food serving

57. Way of serving meals (different dishes, occasions)
58. Way of table setting (different dishes, occasions)
59. Who serves the meal?
60. Why is it served by this person?
61. Why is the meal served this way?
62. Eating groups: participant, time and number of meals, kind of dishes, amount of food
63. Responsibility of meal distribution within the household and in each eating group
64. Rituals before eating (washing hands, praying)
65. Way of serving at special occasions
66. What meaning does this way of food serving have (for the individual/ household/ community)?

67. Cultural/traditional norms and rules for meal serving

Food consumption

68. Number, time of meals, types of dish
69. Way of eating (common/ separate plate/ bowl)
70. Eating groups: participant, time and number of meals, kind of dishes, amount of food
71. Preferences for dishes/ drinks/ spices by age and gender
72. Reasons for preferences (taste, appearance/ texture, health, nutrition)
73. Categorising of dishes/ drinks (good/ bad, healthy/ unhealthy)
74. Reasons for categories; food/ drinks really consumed or avoided because of this?
75. Dishes/ drinks considered best/ bad for different age, gender, groups.
76. Dishes/ drinks consumed by a certain group.
77. Kind of food taboos (plants, animals or parts of it). Why? What does the avoidance mean? What does a rule breaking mean?
78. Knowledge of dishes which can (not) be eaten
79. Fasting: time, duration, period, participants, kind of food avoidance/ taboo
80. Fast breaking: time, participants, kind of food eaten/ avoided
81. Reasons for fasting/ consequences for not fasting
82. Special occasions: time, participants, kind of food/ drinks
83. Food/ drinks offered to guest
84. Cultural/traditional norms and rules for food consumption/ avoidance
85. Why is this dish eaten? Why is it eaten that way? Why is it eaten by this person?
86. What meaning does the eating a dish has (for the individual/ household/ community)?

Individual perception of food/ food habits

87. Categorising/ classification of food (healthy/ good food)
88. Judgment of own food supply situation (amount, nutrients) and eating habits (healthy, good, sufficient)
89. Judgment of own nutritional status (own knowledge about food, nutrients)
90. Judgment of access to ingredients and production/ preparation factors

Changes (individual perception)

91. Comparison of own food habits with these of parents and grandparents
92. Perception of the changes (food habits improved/ deteriorated)
93. Motivation/ impacts for changes
94. Importance of traditions/ changes

Knowledge

95. Knowledge about food and its contents and nutrients (what are particular food/ dish/ drinks good for?)
96. Impact of knowledge about food on food/ meal security
97. knowledge holder, transmission of knowledge, access to knowledge
98. Confidence about/ perception of the own knowledge
99. Connection between knowledge and practice

Glossary

Abreh	Very thin fermented sorghum flakes made to a drink for Ramadan fasters
Abreh-jerjebida	Thin Egyptian bread
Aceda	Stiff porridge from sorghum, millet, wheat, or cassava
Agashé	Kind of grilled meat typical for West Africa
Aish	Arabic: Life and old name for sorghum. Today bread is called aish
Ajin	Dough
Angarib	Traditional bed with a wooden frame and a cover of robes from plant material
Bamia	Fresh okra ponds
Batikh	Watermelon
Berkib	Fermented milk
Bukhssa	Large hollowed out gourd for butter preparation
Burma	Traditional cooking pot of clay
Dabar	Light coloured sorghum variety
Degig	Fine flour
Derish	Coarse meal
Doka	Traditional earthware plate for kisra preparation
Dukan	Little grocery shop
Dukhun	Traditional name for pearl millet
Durra	Name for sorghum
Feterita	Most common sorghum variety
Ful-masri	Dish from broad beans
Gadah	Wooden bowl to serve aceda
Galiya	Medicine and substitute for coffee from sorghum seeds
Garrah	Pumpkin
Geema	Dish from potatoes and minced meat
Gergeriba	Thin piece of palm leaves or plastic to spread kisra for baking
Gurrassa	Pancake-like bread from wheat
Hala/ hala bramo	Metal cooking pot/ hollow pot to cook aceda
Hashab	Gum arabic (Acacia senegal)
Halaujat	Sweets
Hulu-mur	Drink from malted sorghum flakes made for Ramadan fasters
Id al-adha	Most important Islamic feast which starts after the haj, on the 10th day of the last month of the Islamic year, 70 days after the end of Ramadan. Celebrated up to four days
Id al-fitr	Feast of the fast breaking at the end of Ramadan for three days

Jibna-beida	White cheese
Kanon	Charcoal stove
Karama	The sacrifice (slaughtering) of an animal
Karkade	Roselle
Kisra	Paper-thin bread from fermented sorghum or wheat
Kit	Fermented milk
Kufta	Oblong meatballs
Laban-rayeb	Fermented milk
Lubia	Cow peas
Malill	Fresh sorghum that is harvested before it is ripe. The grains are backed and cooked in water. This kind of dish is a typical Ramadan food in Kordofan
Marara	Gut parts of the animal like the lung, liver, and stomach which are spiced with salt, pepper, and chilli powder and are eaten raw
Marissa	Traditional beer from millet
Mashi	Vegetables (eggplant, tomatoes, cucumber) stuffed with minced meat and fried
Matmura	Traditional storage facilities, Grain underground pits
Medida	Thin soup-like porridge of sorghum or millet
Mouaraka	Fat soaked piece of cloth to rub the kisra plate free from remains and avoid sticking of the kisra to the plate
Mufraka	Wooden stirrer
Mugta'a	Traditional tool (wooden) to cut aceda out of the pot
Mulah	Soup-like sauce eaten with aceda or kisra
Murhaka	Stony hand mill, made of a base plate and a long cylindrical roller
Nasha	Thin porridge
Ragoba	Shelter often covered by straw mats
Ramadan	fasting month in the ninth month of the Islamic year
Rob	Dairy product similar to buttermilk
Safra	Light coloured sorghum variety
Saj	Metal plate for kisra preparation
Salabiy	Doughnut-like sweet from wheat flour fried in oil
Salata aswad	Fried eggplants with groundnut butter
Samin	Butteroil
Saqqiya	Animal-powered water wheel
Shaduf	A hand operated water-lifting device using a counterweighted bucket
Sheia	Meat cut in pieces, spiced and fried
Sheil	Traditional credit system
Sheiriya	Sweet pasta
Shermout	Dried meat
Shonah	Traditional storage facility, open air and the grain is stored in sacks

Si'in	Skin bag for butter preparation
Siniya	Round tray on which food is served
Simsim	Sesame
Suweba	Bins (suweba) are another traditional as well as modern storage facility. Traditionally the bins are made of clay, animal dung, and grass.
Tabikh	Thick meat-containing sauce eaten with kisra or bread
Tahniya	Sweet made of sesame
Tabaq	Plaited grass cover to cover the food on the siniya
Tajin	Metal cooking pot
Tamia	Falafel; fried balls of chickpeas
Thurra	Traditional name for sorghum
Tob	Traditional cloth women wear in public
Weika	Dried and pounded okra
Zabadi (laban-rayeb)	Yoghurt
Zeer	Earthware jug to store water

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Eidesstattliche Erklärung

Hiermit erkläre ich an Eides statt, daß ich die vorliegende Arbeit selbstständig und ohne unerlaubte Hilfe verfaßt und andere als die angegebenen Hilfsmittel nicht benutzt habe.

Ich erkläre, daß ich die Arbeit erstmalig und nur and der Humboldt-Universität zu Berlin eingereicht habe.

Mirjam Röder